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New London Rail and Tramway Schemes.

THE Londoner who travels daily between his suburban retreat and one of the several busy centres of the great city, is not infrequently a man with a grievance. He may object to the duration, discomfort, or the uncertainty of his journey by rail or tramway, or to the necessity for a second instalment of travel after reaching the discharging point; or, again, he may object to all these things. But he makes no effort of any kind to remove, or to mitigate, the conditions about which he grumbles in a resigned sort of way to his fellow-sufferers. His journeys are beguiled by the perusal of some favourite paper, wherein he may find harrowing accounts of extravagant outlay on tramways by the London County Council, of the devastating effects of "the tube," and of audacious American attempts to interfere with metropolitan traffic facilities. At these things he shakes his head sadly, but it never occurs to him that if he and his fellows would but awake, and arise in their might, the whole cumbrous and jog-trot system of locomotion now prevailing could be swept away, or merged in a swiftly moving flood of improvements. Yet while the Londoner is alternately dozing and complaining in his corner seat, improvements are being developed, and striking evidence of these is afforded by the map recently published by Mr. Stanford.* In this publication are included railways and tramways, in operation, sanctioned, and proposed. Of railways and tramways in operation little need be said. The older railways were not primarily intended for metropolitan so much as for national use, and as a general rule their terminal stations were placed in very out-of-the-way situations. This drawback has since been removed to some extent by the construction of more central stations, and by the aid of running powers over newer lines, but the popularity of these communications has altogether outgrown their carrying capacity. Suburban lines built in the earlier part of the last generation were usually designed to afford communication from east to west along the most devious and inconvenient routes possible, and later some equally roundabout communications were established between north and south. In quite recent times the idea has been realised of affording more direct routes, but much remains to be done.

Amongst the railways already sanctioned there are several of great value. The Whitechapel and Bow Railway is calculated to relieve pressure at outgoing points, and its connexion at Bromley-by-Bow with the London, Tilbury, and Southend line provides further means of access to suburban and rural parts of Essex. The Great Northern and City Railway will do much to abolish the fearful overcrowding of trains from Finsbury Park to Broad-street and Moorgate-street Stations, and will bring passengers direct from Wood Green to the Bank. The Great Northern and Strand Railway, branching from Finsbury Park, will discharge passengers in the immediate vicinity of the Law Courts, thus obviating the necessity for a tedious, and frequently unpleasant, journey by omnibus from King's Cross. Another useful line will be the Charing Cross, Euston, and Hampstead Railway, giving residents in the north-west a direct route to the extremely busy district around Trafalgar-square, and affording valuable means of connexion between the London and North-Western terminus and the same locality. A branch from this line is shown on the map, commencing at Kentish Town-road and ending in a somewhat inconsequent way near the Highgate Station of the Tottenham and Hampstead Junction Railway. The Baker-street and Waterloo line is indicated on the map, but for some unknown reason it is not accorded a place in the reference table, where similar, and not more deserving, undertakings are briefly described. This line, with a branch to Euston and another to Marylebone and Paddington, will serve to distribute heavy human freight from four of the most inconveniently placed termini in the whole metropolis, besides placing semi-suburban districts in direct communication with the West End, and affording means of connexion between north and south by a junction with the Charing Cross, Euston, and Hampstead Railway. A line from the Marble Arch to Cricklewood is also marked on the map as being sanctioned, although, so to speak, boycotted by the reference table. By connexions at Paddington with the Baker-street and Waterloo line, and at the Marble Arch with the Central London line, this railway should be of considerable value, and will be still more so when carried on to Victoria as proposed. In the extreme west we notice with regret that two lines are projected through the little known and old-world "parish" of Twyford. Although less than a mile and a half from the busy railway junction at Willesden and within six miles of Piccadilly, Twyford is, or was a year or two ago, one of the most rural places in England, and curiously enough it was, down to comparatively recent times, an extra-parochial liberty owing to the fact that Twyford Abbey was omitted from the general ecclesiastical survey. In the south, the line joining London Bridge and Waterloo, with feeders from Walworth and Brixton, will form another useful connecting link between north and south, as well as a rapid means of conveying business people to and from the City. Of tramway lines sanctioned, the only important examples are two branches from the Angel, one along Rosebery-avenue to Gray's Inn-road, and the other to the Metropolitan Cattle Market. Although the record of lines sanctioned is by no means extensive, yet when taken in conjunction with the Central London Railway, the newly-opened line to the Angel, and the development of electric tramways in the western suburbs, it will be seen that considerable progress has been made.

Coming now to railways proposed, we find far more to occupy attention. Commencing with the north-east district, the first fresh feature is a line called the East London, City, and Peckham Railway, running from Plaistow via the East India Docks, Commercial-road, and Whitechapel to Fenchurch-street; thence crossing the river, and ending near Peckham Rye. So far as the northern arm of this line is concerned, it will no doubt be appreciated by the working classes and by many of those employed in the City whose remuneration suggests strict economy both in house rent and in travelling expenses.

* "A New Map of Metropolitan Railways, Tramways, and Miscellaneous Improvements." Deposited at the Private Bills Office, November 30, 1901, for Session 1902. London: Edward Stanford, 1902. Price 6s.

The City and North-East Suburban Railway is intended to start from Queen Victoria-street, proceeding near the riverside towards Fenchurch-street, passing thence along Whitechapel-road, through Bethnal Green, Hackney, and Leyton to Walthamstow. Beyond Hackney a loop line and connexions with other railways are also suggested. This line taps an exceedingly populous district, of which Leyton and Walthamstow have hitherto been solely dependent on the Great Eastern Railway and the line of horse trams along Lea Bridge-road. The North-East London Railway (No. 2), starting at Fleet-street, is intended to pass by Cannon-street Station, proceeding along Bishopsgate-street, through Shoreditch, Dalston, Stoke Newington, and Stamford Hill, to Tottenham, having a branch through Upper Clapton into Essex. This line passes through a thickly-populated part of London, where the tram services are largely patronised, partly because they are cheaper and, taking everything into account, not less expeditious than the train services. A rapid electric railway should therefore be an immense boon along the route mentioned. A proposed extension of the electric line from the Angel to St. Pancras and Euston is another admirable idea marked on Mr. Stanford's map, to which no reference is made on the table before mentioned. Such a junction as this would afford one more alternative route to the City for North-Western, Midland, and Great Northern passengers, in addition to facilitating communication between north and south. In the north-west district nothing new is proposed beyond an extension of the Charing Cross and Hampstead Railway towards Edgware, and perhaps for the time being nothing is urgently wanted.

Between the City on one hand, and the western and south-western districts on the other, many improvements are foreshadowed by the Bills now before Parliament. The Central London Railway is proposed to be extended along Goldhawk-road to The Grove, down which it will pass to Hammersmith Broadway, thence along Hammersmith and Kensington roads, Kensington Gore, Knightsbridge, and Piccadilly to the Strand, ultimately joining the existing Bank station in the City by means of a loop passing beneath Liverpool-street Station. Thus a "circle" would be formed providing a double set of up and down lines to and from the City and West End, and presenting great possibilities in the way of picking up traffic brought from other quarters by tramways and railways. The extension would destroy the almost isolated condition from which Liverpool-street now suffers, besides helping to relieve the streets from passengers discharged at Ludgate Hill and Charing Cross stations. The Brompton and Piccadilly Railway is proposed to be carried from Holborn through Piccadilly and Fulham-road to Brompton, terminating at Parson's Green, once a secluded place with quaint red brick houses amidst cabbage fields that are now devastated by bricks and mortar unalleviated by any visible sign of the architect's hand. The Charing Cross, Hammersmith, and District Electric Railway is shown extending from Adam-street, whence two branches diverge, one passing under the Mall and the other under Piccadilly, to meet at Hyde Park Corner, following the main road thence to Hammersmith and terminating in a power station at Barnes. The King's-road Railway is ultimately designed to connect Putney with Victoria, where competition with the existing companies is sadly wanted.

Two important lines are projected by the London United Electric Railways. One starts with a loop round Charing Cross station, and proceeds by way of the Mall and Constitution Hill to Hyde Park Corner, and thence to Hammersmith with a branch to a power station near the well-known landmark, "The Crabtree." At Hammersmith Broadway, the line turns to the right through Brook Green and again along Holland-road, forming a loop which is closed at Addison-road. The second line commences at Clapham Junction, crosses the Thames at Grosvenor-road, where a tramway will ultimately be established to convey passengers as far as Lambeth Bridge, and the railway continues beneath Sloane-street and Hyde Park to the Marble Arch and Paddington. The latter line will be a most welcome innovation to numerous passengers who are now compelled to use the South Coast railway to Victoria, there to struggle at the omnibus stand for inside seats in winter, and outside seats in summer, frequently with unsatisfying results. The route is further valuable as one more link between north and south. Another line is described in the reference table as the Piccadilly and City Railway (No. 2), and its most remarkable feature appears to be that, starting from Charing-cross and ending at Hammersmith, it does not go anywhere near the City. On the south side of the river, Wimbledon is to be served by a new railway, traversing Wandsworth, Battersea, Lambeth, and Southwark, crossing the river and entering the City next to Cannon-street station. At present Wimbledon people have only the South-Western route, with its annoying change of carriages at Waterloo, the devious and unwholesome alternative presented by the Underground Railway, and that offered by the wonderfully circumambient lines of the South Coast system. A direct line to the City is, therefore, a desideratum. The new London and Brighton Electric Railway is a metropolitan railway in the sense that if made it will serve the useful daily purpose of conveying people into and out from town, and so of relieving other lines. Of course this venture is being vigorously opposed by the rival company. It is only natural that it should be; but why Parliament should allow traders to enhance the cost of rival undertakings, and to delay their inauguration to the detriment of the innocent and long-suffering public, we really cannot imagine. It is proposed that the Victoria, Kennington, and Greenwich Railway should proceed south-east from Victoria, passing near the Oval, through Camberwell and New Cross to Greenwich. The projected line should rejoice the hearts of the numerous travellers who suffer from the South-Eastern and Chatham Railway service to the West-end. Between Wimbledon and Dulwich there is a large district with a rapidly-increasing population, which being beyond the reach of the numerous facilities afforded in the neighbourhoods of Brixton and Clapham would gladly support an alternative to the South Coast Railway, now possessing a virtual monopoly, tempered, but hardly stimulated, in one or two places by casual competition from the South-Eastern and Chatham Railway Company. For residents in this region there is no promise in Mr. Stanford's map. Passing a little more to the east, we notice the proposed City and Crystal Palace Railway, to start from Cannon-street and to finish at Penge, passing through Southwark, Peckham, Forest Hill, and Sydenham. This, again, ought to act as an awakening influence on existing lines, and to be a material aid in the daily labour of moving the floating population of the City. Running more or less parallel with the last-mentioned line is the southern portion of the East London, City, and Peckham Railway, terminating at the upper end of Peckham Rye. No attempt is being made to bring passengers to the City from the more eastern parts of suburban South London, and this we think to be unnecessary for the present, as the bottle-necked terminals of existing lines should be considerably relieved by means of the communications already suggested.

We turn now to examine briefly the tramway lines projected for the Metropolis, commencing, as before, in the north-east. Here nothing of importance is to be found, and the first development of consequence is a line of rails from the Marble Arch to Cricklewood, with a branch from Abercorn-place to Harrow-road, both promoted by the London County Council. From the same starting point a line, proposed by the London United Tramways, is to run to Shepherd's Bush, which is evidently destined to become a great clearing place for passengers in the far west. Hence a branch line is to be taken to Latimer-road, and the main line will be continued to Hammersmith Broadway, another important junction of the future. From Willesden Junction a line by the same company is intended to proceed down Scrubs-road and Wood-lane, meeting the Shepherd's Bush to Hammersmith rails before Brook-green is reached. Going a little more west, a branch is proposed from the existing electric tramway to East Acton and joining at Acton station on the Great Western Railway a tramway running from Acton village, if it may still be so called, to Harlesden-green. From Hammersmith two other main lines are proposed, one to Richmond and the other along Fulham Palace-road to Putney. County Council tramways are to run along the river side almost continuously from Battersea Bridge to Blackfriars, and sundry other connecting links between north and south are proposed by the same body. The latter were noticed in our columns a short time ago, and need not now be mentioned in detail. On the southern side of the Thames the London County Council proposes a tramway route from Clapham Common through Wandsworth and Putney Heath to the Robin Hood Gate of Richmond Park. From the present terminus at Streatham the lines are to be prolonged to Norbury railway station; at Camberwell Green a tramway is to start, running through the highly respectable and delightful district of Denmark Hill, and, together with an existing line from Peckham, joining on to the Crystal Palace Light Railway at Lordship-lane. South of the Crystal Palace the Croydon District Electric Tramways propose to run in all directions, so as to bring home to quiet residents the truth that they do not live so very far away from the great hive of men after all. Lewisham is to be connected up to New Cross by a

short branch line under the auspices of the London County Council; the restfulness of Blackheath and Shooter's Hill are to be invaded by a line ending at Eltham Common, where a further tramway route will be found extending from Woolwich Arsenal to Eltham village. Finally, the southern extremity of the Blackwall Tunnel will be connected by a branch line with an existing tramway at East Greenwich.

A careful study of Mr. Stanford's map reveals the fact that the proposed improvements far outweigh in importance those already sanctioned, and, assuming them to be duly completed, there can be no doubt that one of their ultimate effects will be to change the aspect of many outlying districts within a comparatively short space of time. The inevitable substitution of electric for horse traction will make the change still more rapid, for tramways will then compete on more equal terms with railways. The daily exodus from business quarters of the metropolis will be conducted with greater comfort, but perhaps not with greater celerity, because all classes will travel greater distances—some to the outer suburban districts of to-day, and others to find more secluded spots, where tramway bells and cheap villas are not.

NOTES.

A Day's Work in Bricklaying.

A LONG letter from Mr. Stewart, the building manager to the British Westinghouse Electric Co., relating to the number of bricks per day laid by the bricklayers engaged in the erection of the works for that company at Manchester, appeared last Monday in the *Times*. Replying to the questions, "What is the thickness of the walls? Was mortar or cement used?" Mr. Stewart says that in no instance are the walls less than 19 in. thick, and that in some instances they are 23 in. thick, also that mortar was used, not cement. All the walls are "piers." In the centre of each brick pier is a large "Z" bar steel column. With one exception all the buildings are faced with No. 2 stock brick. This work may therefore be regarded as closely approximating in character to that performed by the bricklayers employed by the London County Council, but the average number of bricks laid per man per day was 1,400, as against the trade union standard of 450, or the London County Council average of 330. For "common work" the Westinghouse now averaged 2,250 bricks per man per day. Some explanation of the difference between the speed of British and American work is to be found in the following statement. "Our mortar is made much softer than that commonly used in England, and the bricks are laid by a light pressure of the hand and a light tap of the trowel, instead of by repeated hammering of the trowel to force the brick into place in stiff mortar. By the use of soft mortar we can lay enough mortar with one stretch of the trowel for half a dozen to a dozen bricks." Now, one stretch of the trowel with stiff mortar such as is used in this country will suffice only for three bricks, and it is evident, therefore, that since each trowel charge of stiff mortar is of greater weight, and is more difficult to work, than the same charge of sloppy mortar, and will suffice for less than one half the number of bricks, the weight of mortar and the work expended on a given area of finished brickwork laid on the British system must be much greater than a similar area laid on the American system. For 9-inch walls there is no doubt that the maxim, "Wet bricks and stiff mortar," must be retained, but it is possible that for walls exceeding 18 in. in thickness British builders may without much risk increase the speed of bricklaying by using more water in the mortar. We are of opinion that the use of sloppy mortar in the American fashion produces inferior brickwork to that erected on the British system, though we have never heard that American brickwork is unsafe, and modern factories are seldom required to be durable in the British sense of the term. But even for high-class British work the number of bricks laid per day should not be less than 600.

The Plumbers' Registration Bill.

THE Plumbers' Registration Bill, which was read a third time and passed in the House of Lords this week, we should imagine will be hailed with satisfaction by the community at large. To every householder it is of the utmost importance that the plumbing work about his house should be most efficiently performed, yet as to no class of work is it so difficult for him to satisfy himself as to its quality. The object of this Bill is to enable plumbers, if they so please to become, registered, and by means of a penalty to prevent those not duly qualified from describing themselves as registered. As it is not obligatory and confers no privilege on plumbers who register themselves, the efficiency of the measure will rest with the public themselves. The Bill provides for the Constitution of the Plumbers' Registration Council, in the first instance by the Local Government Board; the Council to have power to frame schemes generally, and to determine the qualifications for registration, and to have certain disciplinary powers over registered plumbers. Schemes framed by this Council have no validity until confirmed by the Local Government Board, after consultation with the Local Government Boards for Scotland and Ireland. Any scheme so confirmed has to be laid before both Houses of Parliament, and can be annulled either in whole or in part if either House presents an address within a certain period requiring the same. The date on which the register has to come into force is to be fixed by the Council.

The Home Office and Acetylene Generators.

ON Monday last the Report of the Committee on Acetylene Generators appointed by the Department of his Majesty's Inspectors of Explosives was issued as a Parliamentary paper. The Committee is of opinion that no generator should be considered safe unless it complies with the following conditions:—1. The temperature in any part of the generator, when it is run at the maximum rate for which it is designed, for a prolonged period, should not exceed 130 deg. C. 2. The generator should yield not less than 4·5 cubic ft. of gas from every pound of calcium carbide (capable of yielding 5 cubic ft. of gas) used. 3. The size of the pipes carrying the gas should be proportioned to the maximum rate of generation. 4. The carbide should be completely decomposed in the generator, so that the sludge discharged shall not be capable of generating more gas. 5. The pressure in any part of the apparatus on the generator side of the gasholder should not exceed 20 in. of water, and on the service side of the holder, or where no holder is provided, should not exceed 5 in. of water. 6. The apparatus should give no tarry or other heavy condensation products from the decomposition of the carbide. 7. Regard should be had to the danger of stoppage of passage of the gas and resulting increase of pressure which may arise from the freezing of the water. Steps should be taken to prevent the possibility of freezing. 8. No lime sludge should be able to gain access to any pipes intended for the passage of gas or circulation of water. 9. Glass gauges should be avoided when possible, and, where necessary, should be protected. 10. The air space in the generator should be as small as possible. 11. The use of copper should be avoided in such parts of the apparatus as are liable to come in contact with acetylene. This list of conditions appears somewhat formidable, but merely enumerates the principal defects liable to occur in faulty generators. There are several generators on the market which meet all the requirements of the Committee. Architects or builders interested in the erection of acetylene generators would do well to consult the Report itself, since it contains much useful information which we cannot afford space to discuss in these columns.

Radio-Active Bodies.

ON Friday evening last week, Professor H. Becquerel, the discoverer of the Becquerel rays, gave a discourse on "Radio-Active Bodies" at the Royal Institution. He began by pointing out the mysterious nature of the radiations given out by these bodies, and that the study of them opened out a fruitful field for physical research. The discovery by M. and Mme. Curie of radium, a substance whose ray-activity was hundreds of times greater than that of the ordinary thorium compounds, or even of uranium, had greatly simplified the study of these radiations. He exhibited a radium compound, which was not only powerfully phosphorescent, but when brought near a fluorescent screen, made it luminous, thus actually showing that it was emitting radiations in all directions. This phenomenon seems to show that radium rays have a resemblance to ultra-violet rays. Professor Becquerel also proved by a very simple experiment that these rays discharge electrified bodies. An ordinary gold leaf electroscope was strongly electrified so that the leaves diverged at a considerable angle. When a small piece of radium contained in a glass tube was brought close to the electroscope the leaves immediately fell together, showing that they had lost their charge. In another even more striking experiment he showed that these radiations greatly diminish the resistance of the air to electric discharges. He arranged a divided circuit in the secondary circuit of an induction coil so that there were two air gaps sparking simultaneously. Bringing a piece of radium within a foot of either spark gap caused the other to cease sparking and consequently increased the brilliancy of the sparks next the radium. Professor Becquerel divided radium radiations into three different kinds. The first kind was deflected by a magnet; the second kind was not deflected by a magnet, but was readily

absorbed by various substances; and the third kind was weaker and more diffused, and was probably due to secondary rays. In conclusion, he described his experiments on the secondary radio-activity of metals. Although the interest of radio-active bodies is at present mainly theoretical, yet it seems to us highly probable that they will in the near future be found of great value in chemical and electrical applications, such as colour photography, the measurement of magnetic fields, &c.

Some Electrical Developments.

IN the fourth of his course of lectures at the Royal Institution, Lord Rayleigh began by explaining how Weber's hypothesis that the molecules of a piece of iron are already magnetised, but are lying about in all directions indifferently, and so do not produce any magnetic effect as a whole, is in close agreement with all the observed phenomena. Professor Ewing has illustrated this by a model which shows clearly why magnetism is not proportional to the magnetising force, and how the friction of the molecules causes magnetic hysteresis. Some pretty experiments, due to Professor Elihu Thomson, were shown to illustrate electro-magnetic induction through space. When a coil of wire with its ends attached to a miniature lamp was brought near an electro-magnet, the lamp lit up. Inserting a plate of glass between the magnet and the coil had no effect, but a thick sheet of copper screened off most of the magnetism and caused the lamp to burn dimly. When a ring of aluminium was placed over the magnet and the current turned on, the ring was repelled several feet high by the magnetic repulsion. The lecturer next considered the mechanical effects of electrical currents, and stated that the general tendency of the mechanical forces is to make the self-induction of the circuit a maximum. This theorem, which we believe is due to Lord Rayleigh himself, is little known amongst electrical engineers, but is a most valuable one, as by its means all the various attractions and repulsions of electric circuits are reduced to one law. Barlow's wheel was exhibited—the principle of which is used in all electric meters which have a disc rotating on mercury—and its action explained by the attempt of the circuit to assume a state of maximum self-induction. He mentioned also how the method is used in Lorentz's apparatus for determining the unit of electrical resistance in absolute measure, and referred to his own experiments to determine this twenty years ago. Professor Viriamu Jones's modification of this apparatus has been set up at Bushy House, and it was intended to make further experiments by this method. Lord Rayleigh suggested that it would be useful in measuring the very small resistances which shunt ammeters for reading very high currents. We fail, however, to see how it could be applied for this purpose, as, even if possible, it would be exceedingly difficult to eliminate the resistances of the points of contact. In conclusion the lecturer praised the Kelvin balance, and stated that he was doubtful about the permanency of the magnetism in the Weston instruments.

Bridges on the Upper Thames.

LAST week a *résumé* was given in these columns of a lecture on the subject of the architectural treatment of bridges by the editor of this journal. An opportunity for the proper treatment of a bridge on the Upper Thames appears already to have arisen, since it is, it seems, necessary to erect a new bridge over the Thames between Whitchurch and Pangbourne. Such a bridge should be essentially simple, but at the same time in harmony with its charming natural surroundings. Whether this object will be attained, remains to be seen. The architecture of the Upper Thames, in seeking after the picturesque, has too often become exaggerated, and wanting in truth and simplicity. The more simple a riverside cottage is, the better it harmonises with the woods and water; protruding gables and recessed doorways do not necessarily make a really artistic house. In the same way an attempt to treat a bridge "picturesquely" will probably result in a lamentable failure. It is probable that in no long time a new bridge will have to be built between Goring and Streatley, then another opportunity will occur. We wish that the local authorities could see their way to build stone bridges, but we are afraid that iron is sure to be the material used.

Boiler Explosions.

THE report on the working of the Boiler Explosions Acts for the year ended June 30, 1901, has just been issued, and furnishes less unpleasant reading for architects and heating engineers than many of its predecessors. The only explosion recorded in connexion with a warming apparatus occurred in a chapel at Heywood in October, 1900, and as no one was injured, a preliminary inquiry only was held. The facts elicited at the inquiry were that the inner tube of the annular vertical boiler, which was only two years old, gave way on account of over-pressure, which was probably caused by the negligence of the attendant. Not a single explosion due to frost is mentioned. We doubt whether the next annual report will be as favourable.

A Newspaper Storage at Hendon.

THE Trustees of the British Museum expect shortly to be provided with a depôt for the storage of newspapers at Hendon, in respect of which a sum of 3,000*l.* on account is set down in the Estimates for the next ensuing financial year. Although negotiations have been entered into for the gradual acquisition of the houses which now surround the British Museum on the north, west, and east sides, it is found that further and separate accommodation is needed to meet the influx of newspapers, amounting to an average of about 750 each weekday. The scheme contemplates the building of a storehouse at Hendon for a stock of the provincial, colonial, and other newspapers that are only occasionally required, and the establishment of a staff of messengers who will carry the bound volumes to and fro for readers at the Museum. It is stated that a site of 6 acres has been bought for the new buildings at the Hyde, Hendon.

An Exhibition of Statuettes.

THERE could be no more fascinating kind of art exhibition than one consisting of statuettes by some of the best sculptors of the day, such as that which has for the first time been arranged by the Fine Art Society at their Gallery in New Bond-street. It is curious, as Mr. Spielmann remarks in his preface to the catalogue, that it is so seldom that we see an exhibition of sculpture only, yet it is the most interesting and intellectual of the arts, and we quite agree that "there is no more convincing sign of a fine taste than a love and appreciation of sculpture." The greater proportion of exhibits are English work, with a few examples of French artists. The French works shown do not surpass any of the English work except, perhaps, in one point—individual and characteristic expression in the heads. This may be carried too far, no doubt, so as to disturb the repose and generalisation of the figure proper to sculpture; but English sculpture as a rule rather errs in the other direction. M. Pernot's "La Sensitive" (57) and M. Hippolyte Lefebvre's "Mignon" (78) are notable examples of expressive treatment; the "Mignon" especially. M. Puech's marble figure, "La Source" (48) is exquisitely graceful, but the head is surely very small. Perhaps the most remarkable of the French contributions is M. Bartholomé's nude figure of a "Jeune Fille Pleurant" (64), leaning forward on a stone or pedestal with her face buried in her hands; a fine work both in a sculptural and poetic sense. Among the English exhibits is the late Mr. Harry Bates's fine basrelief "Homer" (69), and several bronze statuettes by Mr. Gilbert, all of them full of character, but all with a tendency to over-thin and "leggy" proportions; this is especially the case in the one called "Offering to Hymen" (39) in which the figure looks perfectly starved. Mr. Frampton exhibits his gilt and enamelled "St. George" on an agate globe (3), which was before seen in the New Gallery; a decorative treatment of statuette sculpture which is getting rather a fashion, and is capable of very pretty effect, but is a less intellectual form of art than the pure marble or bronze figure depending only on modelling and conception for its effect. Among exhibits of a special character the small studies of a "Drinking Lioness" (58), and a "Leopardess Eating" (59), by Mr. J. M. Swan, are quite admirable. One or two designs for knockers (31, 31A) are unsatisfactory because, as usual in knocker designs, there is no special treatment of the design with a view to use as a knocker. Mr. Alexander Fisher exhibits a frame of enamelled jewellery, and silver and enamel casket, which, though very interesting, scarcely come properly into the programme of the exhibition; we may observe that in the silver casket what may be called the structural design is very weak, though the general effect is graceful. There is much more in the exhibition than we have had space to notice; it is one that our readers should not miss.

Society of Painter-Etchers.

THE twentieth annual exhibition of the Society of Painter-Etchers and Engravers at the rooms of the Society of Water-colour Painters, is a very good one, and we are glad to notice that there seems to be a greater prevalence than there used recently to be of genuine line etching, and less of the other methods which are grouped under the name of etching, but which consist to a great extent in making artificial grounds and rubbing them out. The real life of etching lies in showing what free line can express. Among works of this class are Mr. Goff's "Old Shoreham" and "Chelsea" (6, 7), several of Miss Constance Pott's; Mr. Evershed's delicate study of shipping at

"The Gindecca, Venice" (130); and a good many others which show the true qualities of etching. Mr. Haig's "Amiens" (26) and "Cefalù Cathedral" (28) have more the character of engravings than etchings; we prefer to either his small delicate etching of the north porch of Burgos Cathedral (30). Mr. Strang exhibits several powerful, strange, and mostly very ugly studies or scenes illustrated by blank verse quotations of which the authorship is not given; another one, "The Women at the Cross" (76) is really revolting in the manner in which the figure of the Saviour is treated. Among other things may be mentioned Mr. Van Raalte's study of the interior of a carpenter's shop, under the title "The Band Saw" (106); two or three beautiful mezzotint landscapes by Mr. Joseph Knight, especially No. 118, which is the perfection of mezzotint effect; four very good etchings by Mr. E. M. Synge; a curious and effective silhouette view of "The Trocadéro, Paris" (64), by M. Béjot; and two admirable dry-point figure studies by Mr. Slocombe, though it is rather too bad to give the title of "Andromeda" to a realistic study of a very commonplace model. A good many bookplates are exhibited, of which those by Mr. C. W. Sherborn (110, 111) may be cited as examples of what bookplates ought to be, and three by Miss Bertha Gorst (126) as what they should not be. Bookplates should be conventional decorative design, not landscapes, or other pictorial representations. The special feature of the exhibition is a fine collection of mezzotints by Turner, one or two of which show effects of lightning of wonderful truth and vividness—the lightning almost seems to flash in them. Twelve of the "Liber Studiorum" plates are also included.

Women's International Art Club.

FOR its third annual exhibition the Women's International Art Club has selected the Grafton Gallery, a larger gallery than it has previously attempted to fill, but we doubt the wisdom of thus extending its boundaries. The large room contains a good many very bad oil paintings, some so bad that it is difficult to understand how they came to be exhibited anywhere. An exception is "The Procession" (106) by Miss Lancaster Lucas, which secured an "honourable mention" in Paris, and is a work quite above the average of its companions in the same room. The real interest in the large room is the collection of Miss E. M. Rope's charming bas-reliefs on the dais, especially "The Sea Chase," a beautiful decorative treatment of line and movement in sculpture. She exhibits also a triptych, "Adoration," in the style of coloured relief which Mr. Anning Bell has been mainly instrumental in introducing. A little "Study of a Child" on left of the screen is charming. The best of the pictorial work is in the inner gallery. Among these Mrs. Deric Hardy's "Rest, Rest" (114), a lifesize oil-sketch of a mother and child, is a beautiful work. Among the smaller works here are four landscapes by Miss Evelyn Howard (132 to 135); an excellent picture of "The Quay, Ely" (154), by Miss Rose Barton; two or three charming little landscapes by Miss Catherine Howard, of which "On the Road to the Sea" (158) is an exceptionally fine composition; a cat picture by Miss F. Fairman which pretty nearly rivals Mme. Ronner; a good landscape by Miss Wright, "Flatford Mill" (243); and a very expressive half-length study of a girl, "Little Patience" (244), by Mrs. Field. In the octagon room may be noticed a landscape by Miss Mary Barton (25); two powerful landscape sketches by Miss F. Molony (44, 45), and a good life-size portrait of a Lady by Miss Gwenny Griffiths. Miss Sara Stanley, who paints architectural subjects, has missed the character of the arcade in the Ducal Palace (34), which depends to a great extent on the diminution of the columns, which are here represented as the same size from top to bottom, and one of them is perceptibly thinner than its neighbours; but painters of both sexes are apt to make many oversights in architectural detail.

The London Sketch Club.

THE eighth exhibition of the London Sketch Club, at 175, Bond-street, is a rather mixed one, containing some very good examples of powerfully sketched effects, and a good many things that are not very interesting. Among those that represent the best ideal of what sketching should be are Mr. Macandrew's "A Hillside" (12); Mr. Hobson's "Norfolk Broads" (16); Mr. Lenfesty's "Clouds" (23); Mr. Walter Fowler's "On the Sands," with a grand indication of sky; Mr. C. Haité's "Clouds" (51); Mr. Hobson's "Solitude" (53); Mr. Dudley Hardy's "Low Tide" (66); and the same artist's "Return of the Boats" (115).

The Goupil Gallery.

THE spring exhibition at the Goupil Gallery offers a fine and interesting collection of pictures, chiefly landscape, of the school which is in general more specially represented at this gallery than elsewhere in London. Among these is a tolerably large landscape by M. Jacque, "The Flock Drinking," which is a work of great power and breadth of style, and has about it a good deal of the quality of Diaz. A perfectly beautiful Corot, "L'Etang de Mortefontaine," hangs in the centre of one wall. Three examples of the work of M. Harpignies, though small in scale, show the quality of a great landscape-painter; the little work called "The Lake" especially. Two pastels by M. Lhermitte are fine examples of his work; there is a sheep picture by Mauve marked by the peculiarity that the sheep for once are heading towards the foreground instead of away from it; and there is a Meissonier, "The Smoker," not quite at his best, but still a Meissonier. Among other works are a fine though melancholy landscape by Herr Weiss, "A Grey Day"; an interior with a very pleasing figure, "The Young Seamstress," by Herr Neuhuys; a study of evening effect by Mr. Thaulow; a fine landscape by Mr. Mark Fisher, "Sunny Afternoon"; a small landscape by Mr. Thaulow, "La Rivière," in which he seems to be rather emulating Mr. Fisher's effects; and two sketches by Mr. Brabazon, "Lago Maggiore" and "On the Quay," which are better, because better drawn, than many of the amorphous colour-blottings by this amateur artist which it seems to be fashionable to admire. There is an example of Diaz down in the catalogue, but unfortunately the work had not arrived. There are one or two things in the collection which are dingy and to our thinking repellent in style; but it is an exhibition with nothing commonplace in it.

THE WHITWORTH HALL, OWENS COLLEGE, MANCHESTER.

ON Wednesday the Governors, teaching-staff, and students of Owens College celebrated (a year too late) the first jubilee of the institution. It was in 1846 that John Owens died, leaving a sum of nearly 100,000*l.* for the foundation of a Manchester college which should be free from the religious tests which were at that time so unhappy a feature of the older universities; but it was not until the spring of 1851 that the work of teaching was begun. The jubilee ought therefore to have been celebrated last year, but at that time the Whitworth Hall, of which the foundation-stone was laid in June, 1898, was not completed, and it was decided to combine the jubilee celebrations and the formal opening of the hall a year later. With the nature of the ceremonies we have little to do. Suffice it to say that his Royal Highness the Prince of Wales delivered a well-written address, in which he regretted the absence of the distinguished architect of the building—a regret which every architect echoes—and finally declared the hall open; that the Duke of Devonshire, President of the College, presided at the opening ceremony; that learned men from other universities attended, some to speak and some to listen; and that Manchester did its best to hide the prevailing grime of its buildings by Venetian masts, bunting, and festoons of evergreens and paper flowers.

The new hall, as the foundation-stone declares, has been given to Owens College "by Richard Copley Christie, Esq., in memory of Sir Joseph Whitworth, Bart." It stands to the left of the principal tower of the group of buildings, and completes the Oxford-street front. The extreme end is towards Burlington-street, and a new corridor connects the hall to the Christie Library, which abuts on the same street in the rear of the new building, and which was opened four years ago. The Whitworth Hall, the Christie Library, and the older buildings of the college have been designed by Mr. Alfred Waterhouse, R.A., and although the work has been spread over about thirty years, there is a general similarity in the treatment. The style is of the variety commonly known as Domestic Gothic—more domestic, indeed, than that adopted by the same architect in the Manchester Town Hall. The walls are faced with stone, laid (as in the Town Hall) in courses alternately deep and shallow—about 9 in. and 3 in.—and the roofs are covered with red tiles..

The new Whitworth Hall is a two-storied building, the hall itself forming the upper story. Externally, the principal frontage is towards Oxford-street, and is a dignified piece of work. The original carriage entrance to the quadrangle is in the ground story of the tower, but as it has been proved to be somewhat narrow, a new and wider entrance has been formed between the tower and the new hall, but set back a few feet from the main building line. A wide semicircular arch on the ground story is surmounted by a steep-pitched gable, containing three lancet windows, and flanked by sturdy octagonal turrets with sunk panels and pinnacles. On each side of this central feature there is a short recessed portion connecting it to the tower on the right and the hall on the left. This entrance group is one of the happiest bits of the external design.

The angle of the hall nearest to the carriage entrance is cut off at an angle of 45 deg., and a single-light window is placed in a narrow bay between the splayed angle and the first buttress. Then follow five bays, each containing a pair of segmental-headed windows in the ground story, and a pair of lofty pointed windows above, with cinquefoiled cusping to the arched heads and to the arches under the transomes. The buttresses are rectangular up to the level of the upper window-heads, and are then splayed to a semi-octagonal plan, and carried 4 or 5 ft. above the parapet, where they terminate—in a not altogether happy manner—with flat tops. The parapet has a considerable projection, the corbel-course being an interesting feature, and containing a band of carving—almost the only stone carving in the whole of the building. A moulded string-course runs under the sills of the first-floor windows, and another at some distance below, both being carried around the buttresses; in the main wall between these strings is a band of shallow panels with arched and cusped heads. The seventh bay is marked

by a projecting porch, forming on the ground floor the principal entrance to the hall. The arched doorway is surmounted by a panelled gable, behind which a second gable rises flanked by octagonal turrets and pinnacles, the apex of the gable being level with the top of the corbel-course under the parapet of the main building. The story over the porch, we may say in passing, forms the landing from which two small galleries at the south end of the hall are entered; a similar landing, but differently treated externally, is planned on the opposite side facing the Christie Library. The eighth and last bay of the hall on each side is marked by a tower in which the stairs to the hall and galleries are placed. To afford space for the winding stairs in each tower a two-storied oriel of segmental plan is projected from the side wall and terminates below the uppermost square stage of the tower; the parapets of the oriels are disproportionately low.

The end of the hall facing Burlington-street is not by any means as satisfactory as the Oxford-street front. The designer has been confronted with the same difficulty which chapel architects have so often to face, and we cannot say that he has been entirely successful in his treatment of it. The wide gable end of the hall has been divided into a large central portion and two smaller side portions by means of two buttresses, square for the first story and semi-octagonal above, and the whole has been flanked by slightly projecting towers, the square portions of which terminate a little above the parapet of the main roof. The central portion of the gable end has a group of four windows with segmental heads on the lower story, and a large six-light traceried window above of ordinary Perpendicular design, and sadly lacking in depth. The apex of the gable is panelled, and the octagonal buttresses are finished with flat tops. The side portions of the gable end are absolutely unrelieved from base to coping, and the regular alternation of 9-in. and 3-in. courses throughout this height gives a rigid, cast-iron appearance which is far from pleasing. The towers are alike, with the exception of the doorway in the lowest stage of that to the left. With this exception, they are of plain masonry (in alternating courses as the rest of the work) up to the middle of the height of the large window in the gable, the only relief being obtained by a pair of string-courses and a coat of arms. The formal effect is accentuated by the octagonal buttresses at the angles of the towers rising unbroken from the base, and with the faces flush with the faces of the parapets. The uppermost square stage of each tower has three lancet windows on each of the two exposed faces, with detached arcades in front; a single light of similar design might with advantage have been placed in each return towards the gable. This stage is followed by a double corbel-course and a parapet with pointed arches simply chamfered. Behind the parapet there rises an octagonal stage—again reminiscent of the Manchester Town Hall—with a pointed arch in each face, and surmounted by an octagonal spire covered with lead, the rolls arranged in zigzag pattern. The shallowness of the windows in the gable end, the cast-iron regularity of the masonry, the straight lines of the octagonal buttresses, and the large unrelieved masses detract very much from the success of this portion of the exterior.

The entrance hall and staircase occupy two bays of the ground floor at the Burlington-street end of the building. The style here is Romanesque, round arches carried by unpolished grey granite columns on lofty stilted bases. The ceiling of the hall is flat, and a small plaster cornice is run around it in such a way as to cover the upper parts of the central voussoirs; the effect is one of weakness. A wide flight of four steps rises from the hall to a landing under the ground-story window of the gable end, and from this landing flights of stairs rise (right and left) to the two towers. Other flights lead from these to the floor of the hall, and others are continued up the towers to the level of the galleries.

The hall itself is a simple parallelogram about 50 ft. wide and 130 ft. long, and bears evidence of a study of Westminster Hall. It has an open timber roof with seven main hammer-beam trusses, and smaller intermediate trusses. Each main truss has a pair of curved principal ribs, cutting through the hammer-beams and meeting in the centre of the span to form a pointed arch. Other timbers, springing from the ends of the hammer-beams, are framed vertically between the trusses to form two series of semicircular arches from end to end of the hall. The panels of the trusses are filled with vertical bars connected at the top by cusped arches. The ends of the hammer-beams carry carved eagles, and are connected by tie-rods—a wise precaution—and the feet of the trusses rest on heavily-moulded, bell-shaped capitals, each of which is supported by an unpolished shaft of grey granite standing clear of the wall.

At the Burlington-street end the first bay is occupied by six stages rising in steps from the floor of the hall, and the principal entrances are placed in the second bay. Small triangular galleries are carried across the angles at this end, and other small galleries project over the entrance doorways. At the opposite end of the hall are two other entrances, approached (by a corridor over the new quadrangle gateway) from the principal staircase of the older building. These staircases are placed near the side walls of the hall on either side of the platform; passages are formed from the doors to the hall by means of glazed screens, in which folding doors are placed to give access to the platform, and flights of seven steps lead down from the passages to the hall. Above these passages, and above the transverse corridor behind the platform a ⌐-shaped gallery is constructed, and a large organ, occupying about three-fourths of the width of the hall, is placed in the back portion. The platform is thus enclosed on three sides. The gallery and screens are of oak, and appear somewhat flimsy in contrast with the massive roof-timbers. The curfew panelling is too shallow for good effect, and the wood arches at the inner ends of the passages are particularly weak.

The hall is lined with oak panelling to the height of above 10 ft., and above this with ashlar in regular alternating courses similar to the exterior. The acoustic properties of the hall are perfect, both for speech and music, and this is a very valuable quality in a building of this kind.

On the ground floor a central corridor about 10 ft. wide runs longitudinally from the principal entrance hall at the Burlington-street end to a smaller hall entered from the new carriage archway. Offices for the college staff and other rooms are provided on either side, including a kitchen and pantry for festivals of a less intellectual character than those for which the hall is primarily intended.

We have said enough to show that the Whitworth Hall is an important addition to the buildings of Owens College. Although we are no purists, we do not admire the staring incongruities displayed in different parts of the structure, but the Oxford-street frontage is undoubtedly a great improvement on the earlier portion of the college in that street; and if we except the principal staircase of the older building, we can endorse the eulogium passed on the new hall by one of our Manchester contemporaries, which describes it as "a piece of architecture into which its author has put the happiest invention shown in any of his work for the Owens College." We must confess, however, to a little sympathy with the "Undistinguished Student," who, in another Manchester paper, writes:—"The buildings of the college never charmed me. Indeed, I felt them cold and forbidding. And I still feel them so. They are utilitarian Gothic, which is a modern addition to the seven deadly sins." This is strong language, and the writer of it would probably have been converted to a different opinion if every part of the college buildings had been as happily conceived as the Oxford-street front of the new Whitworth Hall and quadrangle entrance.

THE LATE MR. BENTLEY.—Mr. J. H. Eastwood, the architect for the new Roman Catholic Cathedral at Leeds, writes to correct an error in our obituary notice of Mr. J. H. Bentley. It was for the old or present cathedral of St. Anne's, Leeds, that Mr. Bentley prepared the decoration scheme; not for the building now in course of erection from Mr. Eastwood's design.

DULWICH COLLEGE.—It is stated that Mr. Edwin T. Hall has prepared plans for the erection of a school library at Dulwich College, at an estimated cost of 3,000*l.* for the fabric, which it is intended shall form a memorial to "old Alleynians" who have fallen in the course of the South African war. The new buildings for the school, opened in 1870, were erected after plans and designs by the late Mr. Charles Barry.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of the Architectural Association was held in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., on Friday last week, Mr. W. H Seth-Smith, President, in the chair.

The minutes of the last meeting were read and confirmed, and the following gentlemen were elected members of the Association:—Messrs. S. Leaning, E. G. Besant, R. O. Constant, F. F. B. Pittar, and B. Procter.

On the motion of Mr. H. P. G. Maule, Hon. Secretary, a vote of thanks was accorded to Mr. Aston Webb, A.R.A., for allowing members to visit on the 15th ult. the Royal College of Science and Victoria and Albert Museum, South Kensington, and for conducting the party on the occasion.

The Chairman said he desired to propose a vote of thanks to the Pearce Portland Stone Co. for presenting to the day school seven cubical blocks from the different beds of Portland stone formation, and to Mr. A. Brumwell Thomas, through whose kind offices they were obtained, and who had also presented some fossils.

This having been agreed to, it was announced that a meeting of the Discussion Section would be held on the 14th inst., when a paper on "Co-operative Homes" would be read by Mr. H. C. Lander.

The Late Mr. Bentley.

The Chairman said he should like to propose a vote of condolence to the family of the late Mr. J. F. Bentley. It was proposed to send a letter on behalf of the Association expressing their sincere condolence, and saying how much the Association appreciated Mr. Bentley's kindness in allowing members to see his splendid work at Westminster, and in promising to let them view it again shortly, and expressing their admiration for his work generally.

The Chairman's motion was agreed to unanimously.

New Premises Fund.

The Chairman said that since their last meeting they had received several additions to the New Premises Fund. The amount previously announced was 3,710*l.*, and the total was now 3,923*l.* 15s. 6d. The additions were:—Messrs. W. H. Seth-Smith, 50*l.* (second donation, making 100*l.*); H. Muff, 10*l.* 10s.; J. Oldrid Scott, 10*l.* 10s.; G. Sherrin, 10*l.* 10s.; L. A. Shuffrey, 10*l.*; W. Hilton Nash, 5*l.*; E. B. Muff, 2*l.* 2s.; and F. Frank Green, 2*l.* 2s.; also 13*l.* from the Architectural Association Day School students, and a provisional promise of 100*l.* from Mr. Rowland Plumbe.

The Chairman said it was particularly gratifying that the day students, who were comparatively new to the Association and its work and interests, should, quite independently, have contributed to the fund.

Mr. R. S. Balfour, Hon. Secretary, announced the following donations to the Library: "Conditions of Contract," by Mr. F. W. Macey, presented by the publisher, Mr. B. T. Batsford, and "The Royal Pavilion at the Paris Exhibition," by Isidore Spielmann, presented by the Royal Commission, Paris Exhibition. He proposed a vote of thanks to the donors, which was agreed to.

The Glasgow International Exhibition Buildings, 1901.

The Chairman then called on Mr. J. Miller to read the following paper on the "Glasgow Exhibition Buildings of 1901":—

In dealing with this paper, before proceeding to describe the buildings in detail, I shall refer briefly to the purposes and scope of the undertaking, and also to the site and its surroundings.

The object of the Glasgow Exhibition, as defined in the official catalogue, was to exhibit the manufactures, products, industries, and material resources of all nations, the machinery and appliances relating thereto, and to present a full illustration of the progress in industry, science, and art during the nineteenth century.

While the undertaking might be called International, inasmuch as most foreign countries were, to some extent, represented, it was not a National undertaking in the same sense as the Great World's Show at Chicago, or the various exhibitions that have been held in Paris. In its inception and development it was entirely local, and with the exception of

the buildings erected by Russia and the minor pavilions of Canada and Ireland, and several private exhibits, the whole of the buildings were erected by the local Exhibition authorities, without any state or outside aid whatever.

With exhibition buildings, as with all buildings, the site is a most important factor in determining the arrangement and design of the scheme. For you can at once understand, when a large area of ground is to be overlaid with a number of buildings, it is of the utmost importance that every advantage should be taken of the site and its natural surroundings, both as regards the design and disposition of the buildings, in order to obtain the best result from a spectacular point of view, not of one building only, but of the whole, and at the same time give the most convenient and suitable arrangement for exhibition purposes.

In Chicago and the several Paris Exhibitions, which have been held from time to time, the symmetrical or axial plan has been adopted, and I think there can be no question that wherever it is possible to produce a plan on axial lines, it is the finest and grandest form. In Glasgow, however, the site at the disposal of the exhibition authorities was somewhat different from those to which I have referred. Kelvingrove Park contains about eighty acres, at least that part of it which was available for exhibition purposes. Through its centre winds the river Kelvin in serpentine curves, and on its north and north-east sides are ranges of high and steep slopes, crowned, in the former case by the University buildings designed by the late Sir George Gilbert Scott, while the latter is surmounted by fashionable terraces, well designed and appropriate to their position. Viewed from the front of the main Exhibition buildings, these features formed a fine, and, in fact, imposing background to the various temporary buildings scattered throughout the grounds.

A leading feature in determining the general arrangement of the buildings was the position of the new permanent Art Galleries, which have been erected on the south bank of the river, directly facing the University buildings. The only large open piece of ground in the park lay between the Art Galleries and the east boundary of the park at Gray-street, running parallel with Dumbarton-road, which formed its south boundary. The extent of this ground was about 800 ft. long by 400 ft. wide. There was no alternative but to place the largest and most important building here, namely, the Industrial Hall, having its principal front facing the river.

Smaller open spaces were selected throughout the park for the less important buildings, and an endeavour was made as far as possible to arrange these somewhat in the form of a semicircle, having for its base the front line of the Industrial Hall. No buildings were introduced within this semicircle, the idea being to preserve this space as a large open area, to be used as a promenade from which uninterrupted views of the buildings might be obtained. It was my intention to have placed a great central feature here in the way of a monumental fountain 60 ft. in diameter, surrounded by a row of columns 40 ft. high, each column supporting a gilded winged figure. From the centre of the fountain rose a great circular illuminated tower 120 ft. high. Such a feature would have formed a climax to the architectural scheme, repeating, as it were, the spirit of the main features of the Industrial Hall and forming a culminating point in the centre of the grounds. This feature I regret to say was never carried out. The park is studded with fine trees, but I might mention that not a single tree was sacrificed to make room for any of the buildings, we believed it better rather to sacrifice the architectural symmetry of the scheme, than to cut down these permanent embellishments of the Park, remembering that the life of our exhibition was only to be six months.

I would here point out that many of the smaller buildings were introduced long after the original plans were matured; the growth of the Exhibition was gradual, and its ultimate extent greatly exceeded the anticipations of the executive; in fact, as time went on, the number of the buildings increased to such an extent that it was with difficulty positions could be found for them. This explains in a measure the somewhat irregular arrangement in certain parts of the grounds. Had the full extent and scope of the scheme been approximately known at the beginning, more might have been made of it from an architectural point of view, but in any case the site was such as would not admit of anything of the nature of a symmetrical or axial arrangement of plan.

Having thus roughly outlined the principal features of the site, I will now proceed to describe the buildings in detail. The buildings may be divided into five groups, namely, first, Industrial Hall; second, Machinery Hall; third, Grand Avenue; fourth, Concert Hall; fifth, the various restaurants, kiosks, and minor exhibits throughout the grounds.

I ought to mention here that the fine arts were housed in the handsome new permanent Art Gallery, recently erected from the designs of Messrs. Simpson & Allen, of London. The design and arrangement of this building are, no doubt, already known to you; it is not my intention, therefore, to deal with it in this paper; but will confine my remarks to those structures designed by myself, and carried out under my direction.

The Industrial Hall was 690 ft. long by 327 ft. in width; its chief features were the great dome with its towers, peristyle, and piazza. The building might be termed cruciform on plan, the dome being formed at the intersection of the main central avenue with the two short cross avenues leading to the main street entrance in Sandyford-street, and to the ceremonial entrance and piazza respectively. The dome had an internal diameter of 72 ft. and the height from the floor to the underside of the lantern was 131 ft. The extreme height from the ground line in front of the peristyle steps to the top of the flying figure on the summit of the lantern being 200 ft.

The dome rises from piers formed of timber, and covered with fibrous plaster; between these spring the four arches under the dome, forming the pendentives. These arches have a width of 49 ft., and are 44 ft. 6 in. high to the crown. They are treated in a broad and simple manner, without any arch mouldings whatever, the pendentives being allowed simply to melt into the extrados of the arches, a form of treatment which suited the plastic material used in the construction, no attempt being made to represent or imitate a stone treatment. The interior of the dome was formed without ribs or divisions of any kind, thus forming an uninterrupted hemisphere. The effect produced by this treatment, to my mind, is to give a dome a feeling of mystery and lightness, it seems to hang or float in the air. Vertical ribs may tend to give apparent height, but with these the construction at once becomes apparent, and the aerial mystery is lost.

The pendentives were enriched by large figure groups, in high relief, symbolical of navigation. These groups filled the entire spandrils, without any framing-in, the extreme size of the spandrils being 50 ft. broad by 30 ft. high. More variety and interest would have been given had the four spandrils been treated with different groups, but want of money and shortness of time prevented this being done.

The piers carrying the dome were constructed of wood up to the level of the external platform, 60 ft. from the floor, the dome itself being formed of steel ribs placed at about 14 ft. centres, connected at top with a braced steel ring of sufficient weight and strength to carry the fleche. Between each of the steel ribs were placed three ribs constructed of wood, 2 ft. 6 in. deep, at about 4 ft. 6 in. centres, with wood purlins connecting the same at exterior and interior, and cut to the curve of dome. The internal surface of the dome was covered with fibre plaster moulded to the curve, and nailed to ¼-in. boarding fixed to the purlins, the fibre plates having a finishing coat of putty lime ⅛ in. thick, as on the external walls. On the outside was fixed ⅛-in. boarding, covered with a smooth surface floorcloth, this being the cheapest and most suitable material we could find to take on the gilding with which the dome was covered, materials like copper or lead being considered too expensive for temporary work. As for the gilding with which the domes and turrets were covered, various materials were experimented with. Real gold leaf was beyond the purse of the committee, and various lacquers and imitation gold leaf were tried, but these soon became black in the chemically charged atmosphere of Glasgow. After various experiments we found the most satisfactory material to be aluminium leaf covered with a yellow lacquer, which gave an effect resembling real gold at about 1s. 10d. per square yard, but even this as a lasting material fell far short of the real article. The effect of aluminium leaf itself was exceedingly good; it gave a fine metallic lustre to the rounded shapes of the roofs and lasts well.

The four great towers surrounding the dome were constructed of wood. The corner posts were of pitch pine, 12 in. by 12 in., rising from a framework formed on top of a solid bed of concrete to which it was securely bolted. The posts were scarfed at the joinings and bolted together; to each of the posts were bolted two 12-in. by 6-in. runners, the intermediate vertical pieces, being 12 in. by 2½ in. The whole framework was braced on the four outside faces by means of two layers of timber sheeting ⅞ in. thick, placed close together diagonally, the outer layer being laid to the opposite angle from the one below. By this means perfect rigidity was given to the towers, and a solid surface formed on which to nail the fibre plaster boards. The four towers were in their turn bound together by the four walls forming the square enclosure, out of which the dome rose. These side walls were constructed of wood, the uprights being 12 in. by 2½ in., and the method of bracing was similar to that already described for the towers.

The outer walls of the main building were formed of 4 in. by 2 in. uprights at 2 ft. centres, braced with 4 in. by 2 in. pieces. The whole of the outer surfaces of the walls as well as all the ornament were executed in fibrous plaster, which was cast in slabs 4 ft. by 3 ft., and nailed direct to the timber framing. For temporary purposes fibre plaster has many advantages over wood. In the first place, it is practically fireproof, a matter of the highest importance in buildings where the structural work is mostly of wood, and which are filled to overflowing with combustible materials of all kinds. Where sepetition of ornament is required it has no rival, and for colour and texture it leaves nothing to be desired. The fibre boards were all cast in the workshop and were ½ in. thick, the outside surface being left rough. They were fixed, leaving a space of about ⅜ of an inch at the joinings, then the outside was entirely floated over with a finishing coat of stucco ⅛ in. thick. This coating was squeezed through the joints left between the boards, and formed a key on the back similar to that formed by plaster on the back of lath. By this means the joints of the plaster work are not so liable to show after being exposed to the weather, and a stronger and more uniform surface is obtained.

The main central avenue of the Industrial Hall had a roof of steel having a clear span of 92 ft. 6 in., or 102 ft. 6 in. over the principals, and was carried through the whole length of the building, except where broken by the dome in the centre. There were seven principals on each side of the dome, spaced about 40 ft. apart, connected by longitudinal purlins, on which rested the intermediate rafters. The arched principals were of box section, and formed of eight L's 4½ in. by 3½ in. by ⅜ in. with lattice-work between, and were designed on the three-hinged system—that is, the bases of the legs of the principals were hinged by pins, 3½ in. diameter, to bed-plates secured to concrete foundations, and the bed-plates were connected horizontally by a flat steel bar, 5 in. by ½ in, to prevent the legs spreading. The principal at the apex was also joined by a hinged joint and a 4½ in. diameter pin. In its elements this type of truss is practically two girders standing on end and resting against each other at the top, where they are joined by a pin; the legs spread apart at the base and are fixed by pins to a foundation, and prevented from spreading by the steel bar, which completes the triangle of forces.

Between the lower, or column, part of the principal along both sides of the avenue were open elliptical arched girders of steel with radiating flat bars. Each of the principals was built in five parts, and erected by means of a steam crane with a 70-ft. jib mounted on a staging 30 ft. high running on wheels. There was another staging, also on wheels, behind to support the parts of the principal as they were erected. The two bottom parts, or legs, were, of course, erected first, and kept upright by forks, one side of which was movable, connected to the back staging. The two intermediate pieces were then fitted to the legs, and finally the apex in one piece with pin in position was dropped in and the whole principal bolted up.

The side roofs were arranged in spans 42 ft. wide at right angles to the main avenue. The principals were constructed of timber on the cantilever principle, and are exceptionally light

in their scantlings, making a very cheap form of roof. They are placed at 12 ft. centres; the ties pass over the tops of the main bearing girders, are attached to the top of same, and are continuous throughout their entire length. The struts of the cantilever, formed of three 6½ in. by 2½ in. battens, rest on the bottom boom of the main girder, and are bolted to the ties at a distance of one-third the span from the main girder. The couples of the centre portion are simply 6½ in. by 2½ in. single battens, the bottoms of which rest on the points of the cantilever. Immediately over the point of the cantilever there is a light lattice timber girder, which acts as a ventilator, and also carries the ends of the astragals of the roof and supports the ends of the corrugated sheets on the flat portion of the roof.

The main girders which carry these principals were of timber with iron ties, and had top and bottom booms formed of three thicknesses of 9 in. by 4½ in. bolted together, and having steel plates at the joinings. They were 4 ft. 6 in. deep, and were built continuous, their entire length being 113 ft. They were supported in the middle by a 10 in. by 10 in. solid post, so that the clear span on either side of this support was 56 ft. These girders were supported at their inner ends by the main principals of the central avenue, and at the outer end by supports formed in the front wall. The astragals for these roofs were T-shaped steel in one length, viz., 23 ft. long from eave to eave, bent over the ridge, and placed at 2 ft. centres, the section being 1½ in. by 1½ in. by ¼ in. The glass was rolled plate $\frac{1}{16}$ in. thick. The glass was fixed with putty and having pins passing through the vertical members of the astragal.

The corrugated iron used was No. 24 B.W.G., not galvanised, but dipped in linseed oil, it being intended to be painted; but, whether painted or not, my experience is that all corrugated iron should be galvanised, even for temporary work which is to be painted, for, if not galvanised, the thin sheets very soon corrode. Galvanising has also the advantage of increasing the strength of the sheet, making it equal to an extra gauge in thickness; and further, if the corrugated iron is galvanised, a better price can always be obtained for it after its use on a temporary building. In designing these roofs the object kept in view was to have as few supports as possible, so as not to cut up the floor space, thereby allowing the exhibits to be arranged in any way that might be found desirable.

An important point with exhibition buildings is the lighting. While windows were formed in the side walls of all the buildings, the chief source of lighting was from the roof, and the area of glass in the roof should be sufficient to amply light the buildings, without reckoning on the windows, as the latter are as often as not covered up by exhibits or decorations. The area of glass in proportion to floor area in this and the other buildings was as 1 to 2, in other words, 50 superficial feet of glass to every 100 superficial feet of floor area, and the lighting, I may say, was satisfactory in every way.

When circumstances will permit, I think a more even and better diffused light is obtained when that part of the roof next the ridge is glazed, instead of having the roof covering here and the glazing lower down. If the roof is a very wide span a second stretch of glazing may be introduced lower down on the slope of the roof, but the largest section of glazing should be at the ridge.

It is important that glazing, *i.e.*, putty glazing, should be done in dry weather. In frosty weather it is dangerous for the workmen engaged on the roofs, and in wet weather the putty does not adhere to the astragal, leakage will result, and nothing short of taking out the glass and reglazing will make a satisfactory job. For these reasons every opportunity of dry weather should be taken advantage of to get the roofs glazed.

For an exhibition, where as a rule time is limited, the autumn preceding the exhibition year is perhaps the best time to get the glazing done. If it is not done before the winter sets in, and the weather becomes unsettled, it will be found a difficult matter to find favourable opportunities to glaze large areas between that time and the opening in May, at least that was our experience, but, of course, the winter preceding our Exhibition was an exceptionally severe one, with an abnormally high rainfall.

In very warm weather it will be necessary to size colour the glass on all roofs facing the south, otherwise the heat will render the building very uncomfortable, especially if the roofs are inclined to be low.

In most of the exhibitions that have been held in this country, the floors of the industrial section have usually been formed with battens 3 in. thick laid with a space of about ¾ of an inch between the planks. In the Glasgow Exhibition, however, the floor of the industrial hall was laid with ordinary 1¼ in. flooring tongued and grooved and laid close. These two methods each have their advantages and disadvantages, the former is more easily brushed and cleaned as the dust falls down between the openings left between the boards, and in the case of any fire arising under the floor its presence would at once be observed and its position located. On the other hand, paper and all sorts of rubbish are pushed down under the floor, and even lighted matches might be thrown down and ignite the material below, coins and other valuables are also liable to drop through the openings. The close boarded floor has the advantage of being much cheaper in the first instance. I say in the first instance, for almost full price can be got for the battens when sold off at the end of the exhibition. The close floor is not so easily cleaned as the open floor, as all sweepings must be collected and removed instead of being brushed through the openings in the floor, but in any case all paper and suchlike rubbish should be carried away in barrows or baskets, and not deposited below the floor. The close floor is warmer than the open one, rendering the stalls more comfortable for the attendants. On the other hand, a fire might arise beneath a close floor, and obtain a considerable hold on the floor timbers (assuming there is a space under the floor) before being discovered, and its position is more difficult to locate. Where there is a space beneath the floor it is advisable to cut the area into sections by means of brick walls carried hard up to the under side of the flooring. These walls prevent currents of air under the floor, which would tend to fan a fire, and in the event of a fire arising they help to confine it to the section in which it arises.

In large exhibition buildings, where immense crowds of people congregate, ample provision must be made in the way of entrances and exits. The exits should be distributed and arranged so as to prevent, as much as possible, congestion of traffic. In spite of this, however, it will usually be found that one or two of the exits provided come in for an extra large share of the traffic on account of their proximity to a railway station or car route. It is, therefore, important that such positions should be carefully studied on the plan, and ample provision made to meet the requirements.

The area of the Industrial Hall was 200,000 square feet, and of this space about 91,000 square feet, or less than one half, was occupied by exhibits, leaving a floor space of 109,000 square feet available for the public, so that the building when crowded would contain something like 27,000 persons. One lineal foot of exit space was allowed for every 519 square feet of clear floorage, which is equivalent to one foot of opening to every 130 persons the building was capable of containing. On many occasions the building was crowded to its utmost capacity, but the exits were found sufficient for all purposes.

The entrances are usually placed alongside the exits; these, as a rule, are the ordinary registering turnstile. The number of turnstiles used in this building was fourteen. These turnstiles are arranged to suit the various classes of visitors, namely, paying visitors, season tickets, railway and steamboat tickets, &c.; sometimes also the attendants are required to pass through turnstiles, in which case separate turnstiles must be provided for this purpose. For closing up the exits and entrances at night nothing is so convenient or more easily managed than the ordinary roller shutter of extra strong make. They are rolled down outside the turnstiles, and when opened are concealed in boxing alongside the lintel. They are easily and quickly manipulated.

Near to the principal public entrance were placed the ladies' and gentlemen's cloakrooms, each with ample lavatory accommodation, with rooms for attendants. Other large lavatories were placed at the west end of this building at its junction with the grand avenue. The number of water-closets provided in this building were thirty-four; washhand basins, thirty; urinals, fifty.

The importance of adequate lavatory accommodation in an exhibition where great crowds of people are massed together for a whole day cannot be over-estimated, and it is for this reason I give these particulars, as the accommodation here provided was considered ample. In addition to what I have given above, lavatory accommodation was provided in all the other principal buildings, and throughout the grounds, but these will be referred to later on. Near to the central entrance were the police, lost luggage, and enquiry offices. The latter should have a separate entrance direct to the outside of the building, so that people can call on business without requiring to pass through the turnstiles.

In a central position near the dome were placed the banking premises, which consisted of a telling-room, manager's private room, with cloakroom and lavatory, and strongroom. Telephone office and post office, also exhibition manager and secretary's office, with committee-room and rooms for the clerks and public office, were centrally situated, and in positions where they could be readily seen by the public. Shipping and railway offices were also placed in prominent positions. These latter need not be large, but just sufficient to contain an attendant with space for the advertisements, but the size will be regulated by the requirements of the company.

Near to the ceremonial entrance, and just at the dome, were the royal reception-rooms. These comprised outer and inner halls, dining-room, and boudoir with dressing-rooms and lavatories for ladies and gentlemen. These rooms are used for receiving Royal or other distinguished visitors who may visit the Exhibition, and are usually fitted up and furnished in a more or less luxurious manner.

An indispensable feature in connexion with the Industrial Hall was the goods yard placed at the west end. All goods were received here and unloaded, checked, and conveyed on trolleys run on rails to the respective stands throughout the hall. A goods office and weighing-machine should be provided in connexion with goods yard.

Having thus described the leading features of the industrial hall, and the necessary offices and accommodation required in connexion therewith, I will just refer to one or two points which in designing such a building it is necessary to keep prominently in view. The gutters of the main roofs should be of ample section, with good falls, and ample provision should be made for down pipes to carry the water off. In a temporary building there is always a tendency to underdo rather than overdo such matters as these, but this is a mistake, as more damage might be done by a heavy fall of rain in half an hour than all the extra cost of having proper gutters and sufficient conductors. For long straight gutters sheet-iron answers the purpose very well. It should be well bolted at the joints, with a layer of canvas dipped in red lead inserted. For flashings, dome coverings, and awkwardly shaped gutters, the best material is undoubtedly lead, say, 4 lbs. to the foot. It is more easily worked to suit the various positions and awkward corners than either sheet-iron or zinc, and although the first cost is more, it will realise about two-thirds of its original cost when the buildings are demolished, so that the ultimate figure will not be much in excess of sheet-iron or a good class of felt when the painting of these latter is taken into account.

As to the construction of the building generally, every precaution should be taken against risk of fire. Were a fire to obtain a proper hold on a building such as I have described, where a large portion of the structural work is wood, and the building filled from end to end with combustible materials, there would be but a very small chance of saving any portion of it. There are no cross divisions of any kind dividing the building into sections, these being hardly permissible in a building of this nature. You can readily imagine, therefore, the rapidity with which a fire would travel when once under weigh, and the serious consequences which would ensue. For while a building of this kind and its contents can be insured against fire risk, just as any other building can, it must be remembered that thousands of pounds have been expended on other buildings throughout the Exhibition, which are merely accompaniments to the main

building, without which they would be worthless, so that the destruction of the main building might mean financial ruin to an Exhibition. If the amount of money proposed to be expended on the building will not permit of steel construction, then it is highly desirable that the form of wood construction adopted should be such as shall contain the least possible amount of timber. As a general rule, it is better to use larger scantlings and fewer pieces than smaller sections with numerous parts, for a fire takes a longer time to get hold of a large section of wood than it does a small one, and spreads more slowly with the former. Fibre plaster should be used for wall linings where required, and any space under the floor should be divided into sections by dwarf walls, as already described.

Fire hydrants, with sufficient lengths of hose, should be placed at intervals along the centre of the building, and the staff should be regularly drilled in the use of these. It is also advisable to have a steam fire-engine located within the grounds, and as near as possible to the main buildings. Two rooms for the fire brigade should be provided, adjoining the main building, having telephone communication with all the buildings throughout the grounds.

Machinery Hall.

This building, as the name implies, was for the purpose of displaying all kinds of machinery, motive power, electricity, and labour-saving appliances, in motion. It was situated on the Bunhouse ground, and was separated from Kelvingrove Park by Dumbarton-road, over which a bridge was thrown to connect this portion of the Exhibition with the other buildings and grounds. Its dimensions were 500 ft. long by 320 ft. wide. It was roofed by five longitudinal spans, the centre one being of steel, with a span of 92 ft. 2 in. The trusses of the side roofs were of wood, having spans of 52 ft. 8 in. These roofs had principals placed 13 ft. 10 in. apart, and were supported on timber standards placed at the face walls of the building and by the main principal of the steel centre span, the intermediate supports being formed by open braced steel girders having spans of 41 ft. 6 in., these in their turn being supported on tapered lattice columns. These columns, in addition to carrying the roof were designed to carry the shafting conveying the motive power to the machinery exhibits.

The roofs were covered with corrugated iron and glass, the area of glass being about in the same proportion to the floor area, as in the Industrial Hall. On the lower parts of the steel trusses forming the centre span were fixed cantilevers of steel, carrying a promenade gallery 15 ft. broad and 12 ft. above the main floor level. On the outer ends of these cantilevers lattice girders were carried which served the double purpose of carrying the floor of the gallery and forming the parapet or railing. These girders were 4 ft. 3 in. deep, and had a span of 41 ft. 6 in. The floor of the gallery was formed of timber joists and decking resting on the bottom flange of the girders. This gallery extended along both sides of the Central Avenue and across the ends, so that visitors were enabled to walk round the building without requiring to descend the stairs leading to the main floor level. At the north end of the hall, three flights of stairs descended to the main floor level from the level of bridge crossing Dumbarton-road, these were formed of timber and having an easy rise, the treads being 14 in. and the risers 5 in. The treads were formed of 7 in. by 2 in. timbers.

The floor of the machinery hall must necessarily be of great strength in order to withstand the heavy weights of most of the exhibits. It should rest on the solid earth after this has been levelled up and consolidated. The floor used here was 9 in. by 3 in. battens laid close together over the entire area and resting on cross runners 11 in. by 3 in. laid flat at 4 ft. centres, forming a strong and solid floor. Pipe channels are required under the floor for conducting steam and water pipes to the various exhibits. These should be formed of ample size, measuring about 3 ft. 6 in. wide and about 5 ft. deep, so as to allow space for a man to walk along and make the various connexions or repairs to pipes. Parts of the flooring should be made movable at convenient intervals to give access to the ducts. For temporary purposes, such as an exhibition, the side walls of the ducts can be formed of wood sheeting, with walings and strutts.

In arranging the exhibits, which, of course, is the work of the engineer in charge of this section, it is better to confine all those which require steam power to one section of the building, the number and lengths of ducts being thereby reduced to a minimum.

The outer walls of the Machinery Hall were formed similar to those of the Industrial Hall, that is, with wood framing covered with fibre plaster.

The ventilation of a machinery hall is of great importance. A midsummer sun streaming through the glass roofs, combined with the heat arising from the network of hot pipes throughout the building, renders the interior at times almost unbearable. Nothing short of mechanical ventilation is of any use, and a system of exhaust fans, sufficient to change the air in the building every fifteen or twenty minutes, should be provided to make the building at all comfortable in hot weather. The flooring over the ducts containing the hot pipes should also be insulated with some non-conducting material, as the boards soon become so hot as to make them uncomfortable to walk upon.

Adjoining the Machinery Hall was the boiler-house, a building 204 ft. long by 70 ft. wide. Here were placed the steam boilers for supplying power to the various machinery throughout the building. The floor of this building was 10 ft. below the floor level of Machinery Hall, but was surrounded with a gallery or promenade 10 ft. wide, running on a level with Machinery Hall floor, so that visitors were enabled to obtain a better view of the plant than they would standing on the floor of the boiler-house itself. Another advantage of the gallery being that it left the entire floor of the boiler-house free for stoking purposes. Both ends of the gallery communicated with the main hall, visitors entering at the one end and going out at the other, thereby circulating the traffic and avoiding congestion.

The boiler-house should be a lofty building and well ventilated at the roof, with doors opening to the outside at floor level, thereby causing a sufficient current of air to carry off the heat generated by so many large boilers. The height of the present building to the wall-head was 30 ft. The best material for the roof of the boiler house is corrugated iron, and this material might also be used with advantage for the walls, providing the building is not conspicuous, and an ornamental front unnecessary.

The floor, of course, should be of granolithic. As a preventive against fire, the mutual wall between the boiler-house and main hall should be of brick, carried up 3 ft. or 4 ft. above the wall head. Where it is at all possible, it is of great advantage to have a railway siding alongside the boiler-house and Machinery Hall, both as a convenient means of getting a supply of coal, and also for facilitating the delivery and removal of all heavy machinery and exhibits.

Near to the boiler-house was placed the dynamo-house containing the various engines and dynamos for the supply of motive power and current for the electric-lighting of the entire buildings and grounds.

At one or two convenient places throughout the Machinery Hall lavatory accommodation for the public was provided, but, in addition to this, it is essential to provide a sufficient number of staff lavatories for the use of workmen. In the Machinery Hall several hundreds of workmen were daily employed during the run of the Exhibition, and in the majority of cases their work was of such a nature that the frequent use of the wash-hand basin is necessary in order that the workmen might present a tidy and smart appearance; and if the lavatories are provided at places easily accessible to the workmen, it will tend to induce the men to make use of them more frequently than if they were placed in out-of-the-way and inconvenient positions.

In connexion with the Machinery Hall there should be provided an engineer's office, including private room, drawing office, and room for clerks or public office, with private lavatory accommodation.

Grand Avenue.

The Grand Avenue connected the Industrial Hall with the Machinery Hall, and also was connected with the Art Galleries by a short cross corridor, so that the whole of the main buildings might be termed as being under one roof. The Grand Avenue was 1,000 ft. long and 75 ft. broad, and had a centre span of 55 ft. broad by 30 ft. high, with an additional 10 ft. projecting from each side for placing exhibits. The roof was of wood, and formed of laminated arch principals placed 14 ft. 6 in. apart, connected by 8 in. by 2 in. purlins, the arch consisting of three thicknesses of 7 in. by 1 in. pieces, with 6 in. by 1 in. wood spears or radiating lattice work, connecting arch to rafters, which were formed of two 7 in. by 1½ in. with 1 in. space between. The upright sides of principals were made of two 7 in. by 2 in. battens, with a 3 in. space to allow the arch to run down between and be bolted to sides of same. At the centre was a large louvred ventilator, running the whole length of the building. The lighting was principally from the roof, and the covering was corrugated iron and glass. The laminated arched roof is one that is particularly useful for exhibition purposes, because of the effect gained at little cost. This form of principal requires to be very carefully constructed. The material used is so light in scantling that the downward thrust of the weight on the roof must be kept rigidly in a vertical plane, for if the arch buckles, which it has a tendency to do if not carefully made and put in position, it becomes an extremely weak truss, and will gradually go from bad to worse.

The principals should be constructed on perfectly level ground, or preferably on a platform; the joints of the laminations should be cut true and joined tightly. Special care should be taken when erecting to keep the trusses flat by poles bound from side to side. The extreme west end of the Grand Avenue connected with the bridge which spanned Dumbarton-road, and the levels, were so arranged that the west end of the avenue and the gallery round Machinery Hall were practically on the same level, and by giving a slight camber to the bridge connecting the two, sufficient headroom was got for the roadway below the bridge. By this arrangement all steps were avoided, and visitors could pass along the Industrial Hall through the Grand Avenue, over the bridge, and round the gallery of Machinery Hall without requiring to make use of a single step.

The Grand Avenue had one entrance from, and an exit to, Dumbarton-road near its centre, in addition to large exits at either end leading into the park.

Concert Hall.

The chief building in the grounds, apart from the main buildings, was the Grand Concert Hall, attached to which was one of the principal restaurants. The Concert Hall was a circular building, this form being adopted chiefly on account of the accommodation required, and the shape of the site available. The building was 140 ft. in diameter, exclusive of the outside surrounding corridor, with a gallery all round except at the portion occupied by the chorus, orchestra, and organ. In the original design for this building an organ recess was formed behind the chorus, and four additional rows of seats were provided in the gallery, with two additional staircases, giving seating accommodation for about 5,000 persons. The plan, however, was curtailed and modified, the organ recess being dispensed with and the width of gallery reduced, so that the building, as executed, could seat about 4,000 persons. Surrounding the building ran a corridor 10 ft. wide, formed as a lean-to against the main building, the various doors opening into the corridor, allowing ample provision for exit. The structural work of the Concert-Hall was of steel. The steel principals were placed at 18 ft. 6 in. centres, at the outer circumference of the circle, and were supported on two circular rows of steel columns, the inner and outer rows being 12 ft. 6 in. apart. These columns rested on concrete foundations to which they were bolted, and were connected at the top and also at the gallery floor level with braced girders. They were also braced at these levels longitudinally, this bracing extending round the entire building binding it together.

The roof was saucer-shaped, and rose to the height of 62 ft. above the floor level at the centre. A cupola surrounded the crown, which served as a ventilator. Wood battens were bolted to the steel work of walls, roof, and ceiling, and to these the fibre plaster was nailed. The hall was lighted from the centre of the roof, and also by side windows. The latter were provided with opaque blinds which were drawn over the windows when biograph or

such like entertainments were being given. The roof externally was covered with McIlwraith's canvas decking, a material having a smooth surface somewhat like linoleum, forming a very suitable surface for paint, and keeping longer clean in a smoke-laden atmosphere than canvases or felts of a rougher texture, which have a tendency to gather dirt more quickly than the smoother material. The jointing of the canvas on a round roof must, of course, be vertical, tapering towards the apex. The cover should be ample, not less than 3 in., and well bedded with red lead in the laps. It should be nailed with copper tacks placed about 1½ in. apart; ordinary tacks, even for a temporary purpose, should be avoided, as, after an exposure to the weather for a month or two, they begin to rust and break away, causing leaks and discolouring the roof.

In laying the canvas, care should be taken that the joints of the various strips are properly radiated from the centre to the circumference, otherwise a twisted effect will be given to the roof, and when a cheap material like this is being used, the workmen are apt to overlook this, their main object being simply to get the roof covered. When properly laid, these lines assist the perspective, by accentuating the curved form of the roof.

The Concert Hall was the only building in which a system of heating was introduced. This, however, was found an advantage, making the hall more comfortable in the cold weather in the beginning of May and in the latter end of October and November. As in most round buildings, there was a tendency to echo in the Concert Hall when the building was poorly filled. A system of festooning hung from the ceiling was adopted, which, to a great extent obviated the defect. For an orchestra or organ recital with a full house, however, its acoustical properties left nothing to be desired. I might mention that the interval of the echo increased as the centre of the building was approached by the speaker, the longest interval being when the speaker was immediately under the apex of the roof—a position, of course, which was never occupied in practice.

The restaurant adjoining the Concert Hall was chiefly constructed of wood, with fibre plaster as a covering on the outside walls. There is nothing in particular to describe about its construction or design. The chief point in restaurants of this kind is to see that ample accommodation is provided as regards the kitchen, its offices, and stores. Large staffs are employed in order to cope with the inrush of visitors on particular days, and unless the accommodation is sufficient the staff as a consequence are much handicapped and visitors disappointed. Although these buildings are temporary, the business which is done in them is very erratic, doing practically nothing at times, while on other occasions they are taxed to their utmost capacity, and the kitchen accommodation provided should be equal to the greatest demand. The kitchen and service-rooms should be situated as centrally as possible. The former should have a concrete floor, and walls of brick, carried up, say, about 3 ft. above the roof, as a protection against fire. In addition to the usual kitchen offices and stores, large beer and wine cellars were provided in the basement, and a separate goods entrance should be provided in some position not too prominent, with direct access to the stores and cellars. In addition to the large dining-room and buffets, it is desirable to provide two or three smaller rooms for the use of private or small dinner parties. Ladies' and gentlemen's lavatories should be provided in all these restaurants, with separate male and female lavatory accommodation for the kitchen staff.

The other buildings throughout the grounds have nothing in particular requiring description, the construction being carried out in a similar manner to those already described.

Artificial Lighting.

I shall now say a word or two on the artificial lighting of the various buildings and the grounds.

Electricity is the only illuminant which should be used for the inside lighting of exhibition buildings. This may be done either with arc lamps or incandescent lights. As to the decorative superiority of incandescent lighting over the arc lamp, there can be no question. The architectural features, such as the curved principals of the roofs, the lines of piers and cornices, can be picked out, thereby assisting the architectural effect of the interior and giving a warmth of colour to the whole. All these advantages are wanting in the cold and uninteresting effect produced by the arc lamp. Of course, to produce the same illuminating power the incandescent requires much more current than the arc lamp, and is consequently more costly; but in most of the large exhibitions a considerable amount of the lighting plant is supplied gratis by exhibiting firms. In the case of the Glasgow Exhibition the steam boilers, engines, and dynamos were supplied practically free of cost to the executive, and had this power been sufficiently augmented by the Exhibition authorities, the whole of the interior of the Industrial Hall, at least, might have been transformed from the cold and unsympathetic effect which it presented with the arc lamp system to the brilliant jewelled effect which was so much admired when the exterior of the buildings was illuminated.

The electric lighting of the buildings was divided into three distinct sections, namely—Industrial Hall, Grand-avenue, and Machinery Hall, and each section was still further divided into several circuits, so that as little inconvenience as possible might be caused in the event of a breakdown.

The Industrial Hall was lighted by means of 345 10-ampere arc lamps suspended from the roofs. The Machinery Hall had 250 10-ampere arc lamps, and the Grand-avenue had 105 10-ampere arc lamps. It is necessary to distribute a few incandescent lamps over the buildings to act as pilot lights when the arc lamps are turned off at night.

The Concert Hall was lighted by 330 16 c.p. and sixty 32 c.p. incandescent lamps; for this building, however, this was not enough. Even although the ceiling was pure white, and acted as a strong reflector, an extra 100 16 c.p. lamps would have given a more satisfactory result.

When large buildings are lighted by the arc lamps, these, as a rule, are placed too low, and have a blinding effect and obscure the view; when kept well up, they give a better and more diffused light without dazzling the eyes, while at the same time they give an apparent increase to the height of the interior. Wherever it is possible, it is desirable to have duplicate systems of electric lighting, and if a supply of current can be obtained from a corporation or some other independent installation, it should be connected to the exhibition system, to be used as a stand-by in the event of any breakdown taking place with the exhibition plant.

Throughout the grounds several systems of lighting were adopted, chiefly electricity, compressed gas, and compressed oil. Very satisfactory results were obtained from the compressed incandescent gas both as regards cost and illuminating power. The gas used was the ordinary corporation gas, which has an ordinary pressure of 1½ in. water gauge and was compressed by two large automatic gas compressors (worked by the city water service) to about 8 in. water gauge. In brilliancy it rivals the electric arc lamp, and I believe the comparative costs are about three to one in favour of the incandescent gas; compared with the ordinary gas system, light for light, the cost of the compressed incandescent system is about one-fourth of the former. The amount of the illuminating power used in the grounds of this system alone was about 240,000 candle power. It is a form of lighting admirably adapted not only for exhibition grounds, but for street lighting in towns, railway stations, and wherever large areas are wanted to be lighted. It was first used on a large scale, I believe, in the grounds of the Paris Exhibition of 1900.

Throughout the grounds eight conveniences, containing lavatories and water-closet accommodation for ladies and gentlemen, were provided at convenient distances. These should not be too prominently situated, but the notice-boards directing to them should be placed in positions where they can be readily seen by the public.

Cost, &c.

I will now deal for a moment with the cost of the buildings. While it is an easy matter for an architect to arrive at the approximate cost of a permanent structure built with the usual building materials, it is a more difficult matter when dealing with temporary buildings on a large scale with light scantlings, and where the cheapest materials and workmanship are used. The following figures therefore may be of some value. The cost of the Industrial Hall was about 60,000*l.*, or at the rate of 1½d. per cubic foot of contents (cubing the building from the ground line to half way up the roofs), or equal to 2*l.* 8*s.* per square yard of covered area. The Machinery Hall cost about 22,000*l.*, equal to ¾d. per cubic foot of contents, or about 16*s.* per square yard of covered area. The Grand Avenue, where no steel was used in the construction, cost 9,300*l.*, equal to ¼d. per cubic foot of contents, or 1*l.* 2*s.* per square yard of covered area. This building, however, was long and narrow, and all its walls were more expensively finished than those of the Machinery Hall. The Concert Hall, where the framework was entirely of steel, cost 12,600*l.*, equal to 2¼d. per cubic foot. The various restaurants and kiosks throughout the grounds, which were built entirely of wood and plaster, ranged in price from 400*l.* to 5,000*l.*, the price per cubic foot of the more ornate being 2d., and of the plainer types 1½d., per cubic foot.

In conclusion, I may say that I have treated this subject merely from its utilitarian and technical side, and in doing so I have endeavoured to bring before you such details and particulars as are peculiarly adapted to the class of buildings under description. While the materials and workmanship of a temporary building are necessarily of a cheaper and rougher description than those used in permanent structures, the mere fact that this is so greatly increases the responsibility of the architect. In the first place, with the permanent structure he is more familiar with the usual methods of construction, and where such buildings are large and important, as a rule he has ample money at his command, and the margin of safety is generally far beyond any strain which is ever likely to come on them. With temporary structures, however, and particularly with exhibition buildings, matters are somewhat different; for while the architect is required to produce buildings of large floor areas with attractive elevations, the money placed at his disposal is, as a rule, none too plentiful for the requirements.

In order to produce the best result he is compelled to reduce the margin of safety of the structure to its lowest limit. The buildings must be stable enough to resist the heaviest gales—its floor and galleries sufficient to withstand the surging and swaying of immense crowds; and it is here the architect is confronted with his chief difficulty, namely, how to arrive at a happy medium as regards his construction, so that he may not spend unnecessarily on materials and superfluous strength, thereby proportionately curtailing the amount of money available for the decorative part of the scheme. If, therefore, the matter I have placed before you this evening, however inadequately it may have been dealt with, should be of value or assistance to any of you who may be entrusted with similar work as that which I have endeavoured to describe, I shall feel satisfied with the effort I have made.

Some interesting lantern views were then shown of the various buildings of the Exhibition.

Mr. H. D. Searles-Wood, in proposing a vote of thanks to Mr. Miller for his interesting paper, said the paper was particularly valuable because of the way in which Mr. Miller had dealt with the details of construction. The subject was one that students might devote attention to with advantage, for if a student could get confidence in covering large areas with few supports, it would be an advantage to him in dealing with permanent buildings. Another matter which was specially interesting from the student's point of view was that exhibition buildings had to be designed so as to produce their effect at once. The designer could not depend on the embroidery of time to hide or touch up any deficiencies in design. It would be interesting to know what the weight of the dome was on the supports; and could Mr. Miller give them any idea of the breaking-up value of the buildings? The buildings containing the steel construction were much more expensive than the others, but was the break-up value of them greater, too, or was there a difficulty in disposing of the steel—a greater difficulty than in the case of the timber? As to the buildings of the Exhibition, they all knew what a charming effect they produced. In his opinion the effect in some respects was more interesting than in the case of the buildings of the French Exhibition, partly on account of

the restraint exercised and of the colour. The general tone of white was more interesting than the more gaudily coloured French Exhibition buildings.

Mr. W. J. H. Leverton formally seconded the vote of thanks.

Mr. G. Scamell, in supporting the vote of thanks, said that reference had been made in the paper as to galvanising strengthening iron. He would like to know the authority for that, for his experience had been quite the opposite. He had occasion some years ago to use a lot of iron hooping, and in talking the matter over with one of our large galvanisers he was told that if he used the very best iron hooping and galvanised it, it would bring it down to common hooping. They experimented, and after working the iron they managed to break it, and found it broke with a large fibrous break. Some of the same iron was then galvanised, and when it was broken it broke with a short fracture: the galvanising had taken the life out of the iron, and had considerably weakened it.

Mr. H. P. G. Maule, in supporting the vote of thanks, said he had not seen the buildings, and he now regretted it very much. Mr. Miller, in his opinion, had given to this country—or perhaps to Scotland, he should say—the most comprehensive exhibition scheme that had ever been carried out in the British Isles, and probably the best. The London exhibitions were lamentably deficient architecturally. One saw in the Glasgow buildings the great advantage of the general scheme and design of all the buildings being in one hand and under one person's design. The paper was full of interest, and there were many practical points relating to the success of an exhibition—points that would not occur to any one in the ordinary way.

The Chairman, in putting the vote of thanks to the meeting, said he desired to express his personal thanks to Mr. Miller for his paper, and to express his sense of the value of the address to members of the Association. He felt sure the students would consider the paper a very valuable one. As had already been said, the ability to deal with these temporary buildings effectively and a knowledge of the principles on which they were designed, and of the many details connected with their erection, must be of very great service to young architects. They must all congratulate Mr. Miller upon the art feeling he had displayed in his designs for the buildings. The work was won in competition, and in the buildings there was that delicacy and art refinement which the French displayed in their work, but sobered by that English—or Scotch, or Anglo-Saxon—reserve which was essential in the production of really satisfactory work. He had felt all along that the fault of the Paris Exhibition was that the buildings were overloaded with all kinds of ornament which was irrelevant to their construction, but in the Glasgow Exhibition buildings a reserve had been shown which, in his opinion, had resulted in the production of the most beautiful exhibition buildings so far erected. The success of the exhibition was only another illustration of what could be done when a sufficient number of people were interested in doing a thing well. The ½-in. scale details shown by the lecturer should be looked at carefully, for it would be useful to understand the construction and the light iron and wood principals. He would like to ask Mr. Miller if acetylene gas was tried in the illumination of any of the buildings. Acetylene gas had come to the front as an illuminant, and, so far as he had had experience of it, it was very successful.

The vote of thanks having been put to the meeting and heartily agreed to,

Mr. Miller, in reply, said he was not able to state the weight of the material of the dome, but the weight of the steel of the main avenue of the Industrial Hall was 1,400 tons; altogether there were 2,600 tons used in both the Industrial Hall and the Machinery Hall. The first estimates they got for the steel was from 12*l.* to 14*l.* per ton, while the last estimates were from 19*l.* to 20*l.*, owing to the rise in the price of materials. As to the breaking-up value of such buildings, a good deal always depended on whether people wanted the material at the time the buildings were broken up. If any one wanted to build a railway-shed or workshop at the time, a good price could be obtained for the material—perhaps from 4*l.* to 5*l.* per ton for the steel work, or even 6*l.* per ton; though in the case of scrap, not more than 2*l.* per ton could be realised, and in that case the wood would be of more value. The breaking-up value of some of the woodwork at the Glasgow Exhibition had actually as much as the original schedule price for material and workmanship, the explanation of that being that where large quantities were quoted for, the prices were cut very low; and when the buildings were taken down and the material was put into lots, builders came and bought small quantities, and higher prices were in that way realised than would be the case if the material was sold in large quantities. As to galvanising iron, it was quite true that galvanising made iron more brittle, and if a hoop were galvanised and bent backwards and forwards it would break more quickly than if not galvanised; but for a roof, a galvanised corrugated sheet of the weight he had mentioned—not much thicker than brown paper—was stiffer than an ungalvanised sheet of the same thickness, and so not liable to give way at the fixings. An ordinary T bar, galvanised, was weaker than when not galvanised, but in the case of corrugated sheeting, the stiffening of it increased the strength as a covering material. As to acetylene gas, it was not used at the Exhibition, although some of the exhibitors had it; he had a very high opinion of it, and it gave a very good light, though not so good as the high-pressure gas with incandescent mantles, and he thought it was a little more expensive. The expense of acetylene gas had come down very much in recent years. As to exhibition buildings, the date was the first thing fixed, whereas with most other buildings the date of the completion of them was left until the building was well advanced. In the case of exhibitions the fixing of the year settled the date within a few days, and the building had to be finished to time. Another point he would like to mention was as to the placing of exhibits in an avenue or corridor. He felt the architect should be consulted as to these matters, though unfortunately this was not always done. In the case of the Grand Avenue at Glasgow Exhibition, which was 1,000 ft. long, exhibits were placed in the centre and along the sides, and the architectural effect was completely ruined. In all long avenues like the one referred to a better effect was obtained when the corridor or walking space was arranged in the centre.

Photographic Records.

The Chairman said that Mr. G. Scamell, the hon. secretary of the Photographic Record Association, was present, and he would ask that gentleman to say a few words as to the objects and work of that Society.

Mr. Scamell said the object of the Photographic Record Association was to collect photographs of any object of interest that might be of use to the architect or the archæologist, or the literary or scientific man, of some future time. The Association had a fairly strong Council, and photographs were collected from any one who would be good enough to part with them. They preferred the whole-plate size, but they did not refuse to accept half-plate or even quarter. The only condition they made was that the photographs should be by some permanent process, either the platinum, carbon, or photo-etching—bromides they did not care about, for they could not be depended upon. The photographs were mounted by the Association—they had chosen a cut-out mount so that the photographs should not be rubbed—and when mounted they were sent to the British Museum, where they were kept in the Print Room. So far, 2,500 photographs had been sent in, and they were available for public reference. It was hoped that the Museum authorities would give them, in time, a good index, for at present the index which was being prepared was rather defective; it was being arranged in counties in order to see how the collection would shape. As to the subjects, the Association accepted anything which was in the transition stage, such as old customs going out; and he appealed to all architect-photographers to let them have suitable photographs for the collection.

The Chairman announced that the next meeting would be held on the 21st inst., when Mr. W. H. Lever would read a paper on "Dwellings Erected at Port Sunlight and Thornton Hough." The paper had been prepared in book form, illustrated, and every member present on the occasion would receive a copy of the paper.

The meeting then terminated.

MAGAZINES AND REVIEWS.

THE *Art Journal* devotes an article to what must be a very interesting collection of pictures by eighteenth-century French painters, which has been lent by their owner, Mr. Reginald Vaile, to the Mappin Art Gallery at Sheffield. One cannot judge of colour from the engravings, but at any rate in point of composition and expression Nattier's group of the Countess of Newbourg and her daughter, which forms the frontispiece to the number, is a specimen of portraiture of quite unusual charm. Among the other illustrations, it does not seem to be noticed that Trinquesse's "Serment d'Amour" is, in point of the action of the figures and the whole *motif* of the composition, an imitation of Fragonard. The illustrated article on "Rothiemurchus" is continued, and a short article on "Artistic Jewellery" shows by some examples what good jewellery is to be had in this country now, if the public were only discerning enough to buy it; but we fear the prevalent taste is still for the ordinary trade jewellery. The writer of a short article on the late Mr. John Brett does not seem to be aware that the painter did not migrate direct from Harley-street to "Daisyfield," but that before that he had lived for some years in another house in Putney, also planned by himself; also a single-story house, with a top-lighted central drawing-room and the other rooms opening out of a corridor round it, and an asphalted flat roof, which was to be the playground for the children. "Daisyfield," on the borders of Wimbledon Common, was planned in a less abnormal but still very original manner, the central portion of the house being a kind of nave and transept, which was divided off into rooms at pleasure by heavy curtains. It seems to have been practically admitted that the top-lighted drawing-room was a mistake.

The *Magazine of Art* is mainly occupied with articles on various artists and their work; the most interesting article being that on Geoges Bertrand, by Prince Karageorgevitch. Bertrand's work, full of genius as it is, is not much known in England, and the article on it, with the illustrations, is worth attention. Other subjects are "Rowlandson" (continued from last month)—the illustration of "Harmony" shows him at his best; Mr. W. B. Hole and his mural paintings at the National Portrait Gallery, Edinburgh, by Professor Baldwin Brown—a sympathetic tribute to the author of a remarkable effort in modern mural painting; Lord Ronald Gower, whose works in sculpture do not appear to us to be worth this special consecration; and Mr. John F. Bacon, a painter of real genius, who has however never quite satisfied the hopes of him which were raised by the two remarkable paintings "The Interval" and "The Announcement" (since called "The Young Widow") which first introduced visitors at the Royal Academy to a new genius in painting. "A Vanished Art" is the title of a short article on old Irish embroidered muslin, with some examples which are sufficient to make one regret that this national art is, as we are told, practically lost. It lost its market some time since through a concatenation of circumstances, and has never revived.

The *Artist* contains an article on, with a good many illustrations of, book-plates designed by Mr. Anning Bell, all of which are admirable as examples of what a book-plate ought to be. Mr. G. R. Dennis, the writer of the article, makes some forcible remarks, with which we entirely agree, on the artistic vulgarity of the realistic order of book-plate—the portrait of the owner sitting in his library, &c., &c. Book-plates, as he says, should be examples of imaginative and decorative design. "Art in the Postage Stamp," by Mr. F. L. Emanuel, draws attention to a subject that has been rather neglected, but we think the author is too hard on the new penny stamp, which, as we have already observed, is not a bad design in a simple and unpretending way, though the others are bad enough. An interesting page of examples of stamp designs is given.

The *Architektonische Rundschau* gives an illustration of a new bank in Stuttgard, by MM. Eisenlohr and Weigle, which exhibits some agreeable variations on Classic detail, and a horrible Kaufhaus building in Berlin designed with thin stone piers running the whole height of the building, with ogee arches at the top, and thin pilasters on their faces capped by naturalistic carved capitals looking like sponges, all the intervening spaces being filled with iron standards and glass; a building

in worse taste, from the English point of view' it would be difficult to imagine. Professor Otto Rieth is the architect. The most satisfactory thing in the number is a small octagonal church with a cupola, for a rural district, designed by Herr Schwechten, of Berlin. From the illustration it appears to be rough-cast or cemented on the exterior; but it is a pleasing little building, which contrasts agreeably with some of the costly vagaries of modern German architecture.

In the *Berliner Architekturwelt* the Rathhaus for Charlottenburg—Messrs. Reinhault & Süssenguth, architects—looks a good deal like a factory or emporium, but includes a design for some very boldly treated iron gates in the principal entrance, which is worth attention. Among the other illustrations is that of a private residence in the Bendlerstrasse, by Messrs. Hart & Lesser, which shows a dignified street front and an original but soberly treated interior staircase. The designs for a Heldengrab, by Herr Schaudt, and a Stadt-thor ("town gate") for a seaport, by the same architect, are like bad dreams. In the latter the arrangement of openings or windows in the top of the front towers so as to give a grotesque suggestion of a human face, represents the lowest depth of bad and vulgar taste. It shows painfully what is the state of feeling about the art of architecture in Germany, that such a monstrosity can be accepted and illustrated in what professes to be a leading architectural periodical.

The *Edilizia Moderna* gives the plan and various illustrations of the new Exchange (*Borsa*) at Milan, a respectable Classic building with a rather fine interior *cortile* with an arcaded loggia round it. A good deal of care and ability has been bestowed on the sculptural and other decorations of the building.

The *Quarterly Bulletin* of the American Institute of Architects is practically a report of the thirty-fifth annual convention of the Institute, held at Buffalo in October of last year. It is largely occupied with papers on the Pan-American Exhibition, its design, arrangement, and decoration; papers which are intended to lay down principles generally applicable to the æsthetic treatment of such exhibitions. There are also two papers on the "Tarnsney Act" in connexion with building operations; the nature of which Act we do not know, but it appears to have occasioned a good deal of criticism from American architects. Some portion of the first paper, by Mr. W. A. Boring, is directed against the Government system of adopting the lowest tender from builders; the following remarks are worth quoting:—

"The architect prepares designs for a building, and in his imagination there exists a beautiful, well-finished structure. He writes the specification describing the construction, which to him represents perfection in solidity, form, texture, and finish, and describes in unmistakable terms his ideal. The builder who puts in the lowest bid reads the specification and checks it off line for line to discover how he can build to come just under the exact wording of the specification and yet omit the necessary expense incident to carrying it out in the spirit in which it was conceived, and submits a proposal accordingly.

The Government, in accordance with the law, which is really mandatory, lets to the lowest bidder, not to the best bidder. Bidders for Government work usually base their figures upon the execution of such work as will pass inspection and be accepted, and not upon the character of work which is ideal.

Perfect drawings, specifications, and documents cannot ensure a perfect building. An incompetent builder cannot, and a dishonest builder will not, do good work, even with excellent supervision and first-class documents. The chief difficulty in obtaining a good building is the system which accepts the lowest bid regardless of the contractor's training or ability or his reputation for doing good work, the only provision being that he must be able to give suitable security and show financial responsibility.

If we start with the proposition that the building is to be a first-class construction, only the highest type of contractors should be permitted to bid. It is well known that an incompetent builder or a dishonest builder will not produce, and cannot by any means produce, a proper building, and it is also well known that all drawings and specifications of good architects call for good construction, so that the real responsibility for bad construction lies with the builder. The trouble is not with the documents, it is not with the superintendent, it is with the builder.

I think I can safely say that there is no architect who would be awarded the commission of a public building who would not be willing to change and perfect his plans to almost any extent were criticism made on them by the secretary of the treasury or the supervising architect. He would endeavour by all means to please and to produce the very best that was in his power. The builder, however, does not assume this attitude. The faults in plans and specifications that are found in a building are very rare.

The question is *where is the system weak touching this view of the case, and how can it be strengthened?* The real difficulties in the construction of the building are: 1. The incompetency of the builder and his organisation. 2. The attempts by the builder to vary from the specifications by supplying work or materials which are less expensive and give greater profit to him.

If it were a fact that the plans and specifications were really to be followed out to the letter, first-class builders could do the work cheaper than the men who bid below them, and the incompetent and dishonest men would soon be driven to the wall.

Under the system of the lowest bidder, when work is improperly done, the proper procedure is to take the work away from the unreliable builder and award it to a better one at a higher price, taking the difference in price from the bondsmen of the first builder, and nothing short of this will cure the evil, but the Government is loath to do this."

Feilden's Magazine contains an interesting article on "Recent Aeronautic Experiments," with illustrations of various types of aerial machines. A leading article under the title "The Industrial Peace," is concerned with endeavours that are being made in New York to devise means to prevent the recurrence of strikes. The following passage is quoted from an American paper:—

"So long as the unions keep fetters on the intelligence, enterprise, and thrift of the individual they are at war with the laws which are at the root of human progress, and so long they are a threat to society. It would be a pretty *good plan to send a few deputations of working men to England, and to give them a chance to see with their own eyes the logical working out of the restrictive idea of the Trade Unionism.* Perhaps Mr. Schwab and Mr. Hanna, and a few other very rich men, may think it worth their while to raise a little fund to carry out this little scheme." "The italics [says the author of the article in *Feilden*] are ours, and we commend the idea to the careful attention of all those who are still inclined to sympathise with the Trades Unions, for it is so very suggestive. Whilst we are busy sending deputations across the Atlantic to see how things ought to be done, they are contemplating the necessity of sending deputations to this country in order to convince their working men of the individual and national dangers that the idiotic policy of the present-day Trades Unionism will, if persisted in, inevitably lead them into."

The *Antiquary* contains a paper by Mr. Thomas Sheppard on "The Antiquities of Brough, East Yorkshire," which gives some interesting information on British remains of different kinds, and is to be continued in a future number. "Thatched Churches" is the subject of a communication by the Rev. G. H. Evelyn White. The writer is not, we are glad to find, a fanatic in favour of thatched roofs (which some persons wish to see revived), but is treating the subject historically. He is quite aware of the practical disadvantages of this undoubtedly picturesque form of roof, and quotes a significant order of the local authority of Ipswich, under date April 22, 1608, to the effect that "all houses and buildings that are now thatched shall have the thatche thereof taken downe, and the same houses, &c., shall be tiled . . . before James' day next." Among the "Notes of the Month" is an illustration and description of an old rush-light lamp which is among the curiosities of the Hull Municipal Museum.

Mr. Claude Phillips contributes to the *Nineteenth Century* an eloquent article on "The Increasing Export of England's Art-Treasures." The article constitutes a very complete summary of the principal sales of remarkable pictures out of this country of late years, the principal danger coming now from America, and from the immense and tempting sums which American millionaires are willing to offer for the acquisition of great paintings out of English private collections; not always in a purely selfish spirit, for some of the American purchasers have presented their acquired treasures to public galleries in their own country. Mr. Phillips concludes with an appeal to the patriotic spirit of English owners—the only form of appeal which can well be made, for it is hardly to be thought of that our Government can interfere to prevent private owners from selling their own property. But Mr. Phillips proposes that at all events an English owner of an important work of art, who needs money, and is tempted by a large offer, should in the first instance give the refusal of it to the Government for a national museum, and that the Government should recognise the necessity, for the honour of the country, of spending money liberally for the purpose of keeping our art treasures with us. These works, as Mr. Phillips says, "are the very heart and soul of the nation, as of the individual; without which there must be spiritual death, for the one as for the other." In referring to the case of the Elgin marbles, as an example of our own past misdeeds in taking native works of art out of another country, Mr. Phillips hardly puts the case for the defence strongly enough. He recognises the fact that in the British Museum the Parthenon marbles have been an artistic influence such as they could not have been if left on the ruined building; but the case is stronger than that: if they had been left where they were at the time Lord Elgin took them, they would have been destroyed altogether, and have been lost to the world, before the recent period when modern Greece awoke to the value of the remains of her ancient art.

In the *National Review* the Hon. Claude Hay writes a very earnest and thoughtful article under the title "Home-truths about Housing." To a great extent Mr. Claude Hay relies upon houses out of London and increased facilities of cheap transit. But he accuses the Local Government Board of being very slack in the administration of the Housing Acts; and he also has some very strong remarks as to the manner in which railway companies, as he asserts, "by private arrangements with owners of property, get the sites they intend to acquire handed over to them clear of the houses, so that they may not be bound by the rehousing clauses that would be introduced into their bills. The purchase of model dwellings adjoining Broad-street Station enabled the London and North-Western Railway to undertake the dispersion of nearly 600 people who could be driven away without any provision being made for them." The author recommends the appointment of a separate commission, such as the Charity Commission or the Railway Commission, whose sole duty should be to direct and control the administration of the Housing Acts—"to supply information to Local Authorities, to stimulate the energies of those that neglect their duties, and to encourage those that are alive to their responsibilities but have to contend with difficulties they cannot surmount without the help from a central well-organised body which is not now forthcoming."

In the *Monthly Review* Mr. Havelock Ellis, in an article on "The Evolution of English Painting," analyses the influences under which the art of painting was developed in England. He considers that Vandyke offered the English public just the kind of painting which it could at that time understand and appreciate. But to say that Vandyke fixed the English taste, or that Reynolds was a kind of English Vandyke, seems to us to be overstating the case. We are inclined to think that Reynolds would have been Reynolds, had not Vandyke preceded him. It is true however that Gainsborough was "much more English than Reynolds," and his method of painting Mrs. Siddons, simply in her natural look and attitude, is significantly contrasted with Reynolds's rather theatrical depiction of her as "The Tragic Muse." In colour Gainsborough certainly has the advantage; but is not Reynolds's a greater conception? Greater, too, exactly in the proportion that it is less insular in taste and feeling.

The *Pall Mall Magazine* includes an article by Mr. E. Walter Maunder on "Changes in the Moon—Real and Apparent." He touches upon an idea which has recently been suggested in some quarters, that the moon is not really so "dead" as we have been accustomed to think, but argues that some apparent changes in the appearance of some of her mountains and craters are rather due to the effects of light and shadow than to any substantial alteration. The article contains some instructive analysis of the relation of the moon's former atmosphere to conditions of gravitation, and reasons why it could not be expected to remain long in connexion with the planet. There is also an article by "An American Correspondent" on "The History of the Canal Treaty"; an article dealing with the political rather than the engineering side of the question. It is accompanied by a map showing the various routes that have been proposed—as many as six: the Nicaragua route, the Chiriqui route, the Panama route, the San Blas route, the Caledonia route, and the Arato route; besides the ship

railway overland route which at one time had its supporters.

Scribner contains an article on "The Heart of England," viz., the business quarter of the Thames and the docks, by Mr. John Corbin, with illustrations by Mr. André Castaigne. The article is pervaded by much appreciation of England and London, in spite of the criticisms, natural from an American, in regard to our slow and old-fashioned way of handling merchandise. "In London to-day the commerce still drifts and is steered. None of the great ports of the world has had a longer or more varied history; it is the heart of the greatest of commercial nations, and the cradle of the mistress of the seas; but it is still regulated by the tide. It is at last well proved, this philosophy of drifting and steering. Who can say that it will not continue to rule the world for another 2,000 years? Its methods are not brilliant, but they are sure."

In the *Century* the article on "The Improvement of Washington City," by Mr. Charles Moore, is continued. The view of the monument and terrace as seen from the White House certainly serves to emphasise the out-of-axis position of the monument, to which reference has before been made, and which it is proposed to remedy by manipulating the lines of "The Mall." There is evidently space enough for great effects, at all events. "A Bavarian Bric-à-brac Hunt," by Mr. P. G. Hubert, may interest those who want a new ground for this particular kind of hunt. There is also "An Authoritative Account of Marconi's Work," by Mr. P. T. McGrath, and "Four Drawings of Animals" almost *en silhouette*, by Mr. C. Livingston Bull, which show a great deal of power.

The *Gentleman's Magazine* contains an interesting article by the Rev. J. W. Cotton on "The Latest Astronomical Heresy," a review of the theory of the stellar universe embodied in a book entitled "The Romance of the Heavens," by Professor Bickerton, of New Zealand University. We have not space to state the theory and the opinions of the author of the article; it is a somewhat complicated matter; but the article will be of interest to students of astronomical theories.

In *Knowledge* Mr. Maunder continues his series of articles on "Astronomy Without a Telescope" and Mr. Cecil Jackson contributes an article on "The Use of Hand Telescopes in Astronomy," in this case with special reference to the observation of the sun.

COMPETITIONS.

BAPTIST CHURCH, ILKLEY.—In the competition for Baptist church and schools, Ilkley, the first premiated design was that sent in by Messrs. Garside & Pennington, Ropergate-chambers, Pontefract; the second premiated design was by Messrs. G. F. Danby and E. M. Simpson, Park-row, Leeds.

QUEEN VICTORIA MEMORIAL, LIVERPOOL.—The first premiated design in the competition for the Queen Victoria memorial, Liverpool, was that sent in by Mr. R. Lindsay Clarke, Christ Church House, Malvern-road, Cheltenham; the second was by Messrs. C. J. Allen, Fredk. M. Simpson, W. E. Willink, and P. C. Thicknesse, Castle-street, Liverpool; and the third by Mr. Henry C. Fehr, The Avenue Studios, Fulham-road, London. The design selected by the committee is the one submitted by Messrs. C. J. Allen, F. M. Simpson, W. E. Willink, and P. C. Thicknesse. The statue, which is 14 ft. high, and of bronze, will be placed on a pedestal 6 ft. high, under a stone-work canopy, designed in the Ionic order. It shows the late Queen in her robes of State, with crown, sceptre, and orb. The dome over the statue is supported by sixteen pillars, arranged in four groups. The ceiling of the dome will be of gold mosaic, lighted after nightfall by electricity, the light being reflected from the roof on to the statue. In front of each group of pillars is an advanced pedestal, and on these pedestals will be placed bronze groups representing Justice, Charity, Knowledge, and Peace. Over the dome, surmounting a gilt globe, will be a winged figure of Victory. Between the advanced pedestals are flights of steps leading to the interior of the canopy. The total height is 56 ft. 3 in.

BAPTIST CHURCH AND SCHOOLS, WELLINGBOROUGH.—The designs submitted by Messrs. George Baines and R. Palmer Baines, Clement's Inn, Strand, W.C., have been accepted for these buildings. The accommodation in the church will be for 601 adults. The estimated cost of the complete scheme, including a tower, is 4,923*l*.

MOUNTAIN ASH MUNICIPAL BUILDINGS.—In this recent competition, the design submitted by Mr. J. H. Phillips, of Cardiff, was placed first by the assessor, Mr. G. Halliday, F.R.I.B.A. Mr. Phillips has received instructions to proceed with the work.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting of this Institute on the 5th inst., Sir Henry H. Howorth, President, in the chair, Professor T. McKenny Hughes gave a short sketch of the history of the early potters art in Britain. He first explained the names which he applied to the various divisions to which he referred the successive types: British, Roman, Romano-British, Romano-English, Mediæval; premising that these were quite arbitrary terms which did not coincide exactly with either divisions of time or distinctions of race, but which, though they might overlap here and there in a greater or less degree, still possessed distinctive characters by which they could be recognised even when thrown together by the survival of the older after the introduction of the newer, or the accidental commingling of remains of different ages. The pre-Roman or British ware, as it was commonly called, was of various type, as might be expected from the existence of so many different tribes in different parts of the country. He drew attention to the scarcity of British ware as compared with that of Roman date, and to the rare occurrence of any except with interments, and suggested that possibly this was more apparent than real, being partly due to the difficulty of determining the age of the plainer vessels used for domestic purposes, and the consequent reference of only the ornamental vessels to the pre-Roman age. The Roman ware was so much better and stronger that it was in time accepted almost everywhere, and the rude and perishable native pottery ceased to be made. In dating finds of pottery, the presence or absence of Samian ware was of great importance, regard being had to topographical conditions. The various Scandinavian and German tribes pouring into the British Isles did not seem to have brought with them much pottery. For the burial of the dead they long continued to import and make their traditional cinerary urn, but for general purposes they adopted and carried on the manufacture of Roman ware. He quoted a passage from the Pontificale of Eegbert, the first Archbishop of York in the eighth century, to show that when those Early English came under ecclesiastical discipline there was a regular form which was used to purify vessels which had belonged to their Pagan predecessors; which proved that the better class of vessels which had belonged to the Romanised Britons was still in use among them. —Mr. F. G. Hilton Price, Dir. S.A., read a paper on "Pawnbrokers' Signs in London in the Seventeenth and Eighteenth Centuries." Money lenders and borrowers of money have existed in all countries from the very earliest times, and instances were quoted from Ancient Egypt and Pompeii, and also several examples were given of Jews and other usurers in England who at a very early period were severely persecuted and punished for their evil practices. After the expulsion of the Jews from England in the reign of Edward I. no trace of them could be found until after the Reformation; but during this period the family of Corsini were settled as bankers in the principal cities of Italy, and they were invited over to England and soon began to practice usury to even a greater extent than the Jews had done. In about the fourteenth century they were succeeded by the Lombards, who were merchants and bankers from the four Republics of Genoa, Lucca, Florence, and Venice, and founded their branches in Lombard-street. From these cunning and industrious people the business of the goldsmith, the pawnbroker, and the banker had descended through many generations to the present time. Pawnbrokers were established as a separate trade about the end of the seventeenth century, and only at the commencement of the eighteenth century did they begin to advertise their trade in the newspapers. The origin of the sign of the Three Golden Balls was attributed to the lower part of the coat of arms of the Dukes of Medici, from whose States and from Lombardy the old goldsmiths came. The most favourite signs adopted by the old pawnbrokers in London towards the end of the seventeenth century were the Bell, Blue Ball, Crown, Golden Ball, Seven Stars, Sun, Three Bowls, Three Blue Bowls, Three Cocks, &c. It was a remarkable circumstance that out of the hundreds of signs of the houses of pawnbrokers from 1666 to 1731 only one occurrence of the Three Golden Balls used by a pawnbroker should be met with, and only one of the Three Balls; but of the sign of the Three Bowls there were a great number. But it appeared that from 1754 to 1765 there was a marked tendency to the adoption of either the sign of the Three Golden Balls or Bowls, or Three Blue Bowls, to the gradual extinction of other signs. After 1765 pawnbrokers appear to have adopted generally the sign of the Three Balls, golden or blue, as the sign of their trade, not as a sign of their houses, as these latter became known by a number. In the discussion that followed Mr. Greg, Mr. Mill Stephenson, Mr. R. G. Rice, Mr. Emanuel Green, and Mr. Henry Wilson took part.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the evening meeting on March 5, Dr. W. de Gray Birch in the chair, Mrs. Collier brought for exhibition a beautifully made Chinese "praying machine" of ivory and silk, also a mother-o'-pearl cross and an ivory carving, both about 150 years old. Mr. Oliver exhibited an old map of London dated 1723, and a finely carved ivory triptich, circa 1650, the centre panel representing the "Descent from the Cross," after the celebrated painting by Rubens at Antwerp. Rev. H. J. Dukinfield Astley exhibited a bronze or copper seal of the early fourteenth century found recently in a field close to the church of Tatterford, near Fakenham, Norfolk. It is of vesica shape, bearing the motto, "Mors Pelicani passio cristi." Mr. Cecil Davis exhibited a portion of a monumental brass, probably of the fourteenth century and of Flemish origin. It presents the peculiarity of representing a group of children with eight faces shown, but only six pairs of legs. The paper of the evening was by Mr. Cecil Davis the librarian of the public library of Wandsworth, and was headed "A Chapter in Local History, Wandsworth, 1545-1558." The parish of Wandsworth is very fortunate in possessing a set of records which are nearly complete from the year 1545, and they present a mass of most interesting and valuable information as to the habits and customs of the people of the sixteenth and following centuries. The church of those days stood upon the site of the present one, the mediæval tower still existing, but outwardly cased in modern brickwork. From the records we learn that the tower was becoming dilapidated in Queen Elizabeth's time, as on her last journey through the town she noticed it, and gave orders to the Archbishop of Canterbury, and through him to the proper officials, to have it put into good order, which was done. The roofs of nave and south aisle were tiled, and the gutter between them was remade in 1551-2 at a cost of 34s. 4d. The walls inside were plastered and covered with painted decorations. There were two roodlofts in the church, with small and great candlesticks, the latter being termed "standes"; also brass pots and bowls, and the sum of 7d. is recorded for keeping them bright. There was also a tabernacle over the stone altar, and there were thirteen images in the church. When the east wall was pulled down recently for the erection of the new chancel, some portions of the earlier church were met with in the rubble lining, including fragments of tracery and a damaged consecration cross. The order for keeping parish registers was issued by Thomas Cromwell in 1538, but the earliest mention in the churchwarden's accounts is under the date 1547-8, when the sum of 2s. (ij's) was paid "for Kepinge the boke of Weddinges, Chrystenyngs and Burialls for ij yeres." No trace of these registers remains, as the parish registers of Wandsworth only commence with 1603. Wandsworth was one of the thirteen churches in Surrey wherein two organs were found by the Royal Commissioners. There are many references to the sale of church goods in Edward the Sixth's reign, and in the next reign the parish is put to the expense of replacing some of them. Many also are the entries of payments made for the destruction of stained glass, for pulling down of the rood-lofts, for the whiting of the church and the putting out of pictures, &c. Mr.

Astley, Mr. Gould, Mr. Williams, Mr. Rayson, Mr. Patrick and the chairman took part in the discussion which followed this most interesting paper, and Mr. Davis was warmly commended for the care and accuracy with which he has compiled these records of ancient parish life.

Illustrations.

WESTMINSTER CATHEDRAL: THE APSE.

THIS illustration is from a monochrome brush drawing made by Mr. W. Curtis Green, from sketches taken on the spot. It shows the exterior treatment of the apse of the cathedral, and the graceful and original towers which flank it. This is what according to English ritual would be the east end of the cathedral, but in this case is the south end, the Catholic Church, as is well known, not attaching any importance to the east and west alignment of the building.

The drawing was intended for publication, with others, in our issue reporting the presentation of the Institute Gold Medal to Mr. Bentley. It can now, unhappily, only be published as an *in memoriam* illustration.

DESIGN FOR A SWIMMING BATH.

THIS design, by Mr. Lionel G. Detmar, is the one which obtained from the Institute the medal of merit in the last Soane Medallion Competition, and is in many respects a very meritorious design.

The following are the author's notes as to his intentions in the design:—

"The above subject for the Soane Medallion offered unusual opportunities for architectural effect, of which I have endeavoured in this design to take advantage, while avoiding such extravagance of plan or lavishness of scale as would render the realisation impracticable.

The main entrance is placed on the long side for effect externally, and for making the dressing-boxes more readily accessible from the entrance-hall, though a more effective entry to the bath-hall is, undoubtedly, through the extra exit placed at one end.

Immediately on entering the building a vista is obtained across the octagonal vestibule, with its central fountain, closed in by the stone screen containing a group of statuary, which would be seen against the background formed by the water in the bath and the far side of the bath-hall.

The stairs to the public galleries are to the right and left, and so arranged that by closing the sliding doors across the hall, the public could be entirely excluded from the ground floor of the building on the occasions of displays in the bath, the same pay-boxes still being made use of.

The vestibule is so placed that every part of the building is entered directly therefrom, and forms, therefore, a species of "Salle des Pas Perdus" on a small scale. The reading and smoking rooms right and left are shut off by cross-ventilated lobbies from the noise and atmosphere of the bath, and the lavatories and bath dressing-box corridors also are entered direct.

The vestibule is planned with its chief architectural effect on the gallery level, as this would be the part used by the public at entertainments, and is treated with a large circular well for lighting the ground floor.

The vestibule forms the central feature of the front elevation, flanked right and left by the low blocks of the reading and smoking rooms, with the low entrance-hall block in front and the bath-hall rising at the back. Thus every department of the building would be visible, and easily recognisable from the road.

With regard to the bath hall itself, the dressing-boxes have been subordinated to the architecture, being screened by a colonnade, but are not kept so far away as to be impossible of supervision, which is necessary for the avoidance of theft. The provision of a 'dressers' corridor' behind a colonnade would minimise the objectionable splashing inevitably caused by persons still in the water.

The main entrance is intended to be on the sea-front; this being one of the conditions. The bath was to be a fresh-water one, which is the more desirable after sea bathing.

The engine-house would be in the basement, under the vestibule."

BAPTIST CHAPEL AND SCHOOLS, TWERTON,* BATH.

THE portions of the buildings herein illustrated, which are now in course of erection, consist of the chapel, vestries, &c. and the infants' classroom; the remainder of the scheme will be carried out at a later date. The chapel, which has three galleries in addition to the choir gallery, affords accommodation for 575 persons, and the classroom accommodates sixty infants. The building has been designed in keeping with the traditional Bath style, and is entirely of stone with green slated roofs.

The architects are Messrs. Silcock & Reay, of Bath, and the work is being carried out by Messrs. J. Long & Sons, of the same city.

* "Tivertm," in the title of the plate, is a misprint.

HOUSE AT BUXTON.

THE house here illustrated was recently erected from the designs of Messrs. Chas. Heathcote & Sons, architects, of Manchester.

The situation is a particularly good one, with wide views of Axe Edge and the high hills on the border of Derbyshire and Cheshire. The house was designed for four entertaining rooms, but this accommodation was cut down in erection to three. The billiard-room has a large and deep fireplace recess or nook, and is used as an inner hall with a billiard table. The outer walls are of rubble stone, faced with Huddersfield parpoints and lined throughout with brick. The roofs are covered with red semi-vitreous tiles, laid on felt. The house is warmed throughout by low-pressure hot water, put in by Mr. Hatton, of Manchester.

The builders were Messrs. Southern & Sons, of Salford. The masonry was executed by the late Mr. Gladwin, of Buxton. Stabling and greenhouses are situated in the rear of the site.

THE SURVEYORS' INSTITUTION:

THE INSURANCE OF BUILDINGS AGAINST FIRE.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, the chair being occupied by Mr. Arthur Vernon in the early part of the proceedings, until the President, Sir John Rolleston, M.P., arrived.

Mr. Penfold, hon. secretary, announced some donations to the Library and the Library Fund, and a vote of thanks was accorded to the donors on the motion of the Chairman.

Mr. C. H. Bedells then read a long and interesting paper on "The Insurance of Buildings Against Fire." After some preliminary observations, he said that from the Great Fire of London in 1666, fire insurance, as a system, might be said to date, and to Dr. Nicholas Barbon seemed due the credit of inaugurating, in 1667, a practicable scheme of insurance for London and its environs. In addition to founding this scheme, Dr. Barbon was one of the largest builders of the new city which arose on the ashes of the Great Fire. It was not until 1710 that insurance offices covered country risks.

The author then considered certain questions which arise in ordinary insurances of building property, the first being the determination of the amount of the insurance. In most cases, he said, it would probably be correctly taken as the cost of erecting a similar building at current prices, but it must be remembered, on the one hand, that policies of insurance often last for very many years and are not revised from time to time as they should be, therefore, some little margin to cover the general increase in cost of labour and material might in many cases be desirable, while, on the other hand, the fact that it often happened that the cost of a building and its insurance value differed widely must be taken into account. If the building was very old it was not worth while insuring up to the figure which the reinstating of the old building at present-day prices would give, if the insured was upon the happening of a loss to be met by a refusal to pay more than the "actual value of the old building at the time of the fire." Again, unless the property was to be covered by an average policy, the element of the proportion which the indestructible part of a building bears to the whole might properly be taken into account. Another element which had to be taken into consideration was the possibility, or otherwise, of reinstating the building if destroyed on its present lines in view of the application of building legislation not in force when the building was originally constructed. He would take a typical case—that of a building used on the lower floors for business purposes and on the upper floors as flats. There was, say, no fireproof floor nor proper isolated staircase nor entrance for the upper part. A fire destroying this building (assumed to exceed ten squares in area) to an extent sufficient to bring the reinstatement within Section 74 by the operation of Section 209 of the London Building Act, 1894, would inflict a money loss on the owner of, say, twice or three times the cost value of the materials destroyed in certain parts of the building, and if insurance was to be an indemnity, this additional liability ought to be covered. When the principle was determined, the fixing of the insurable value was often one of some difficulty. When whole streets of buildings were carried out after a uniform plan, and differed not essentially in details, the problem was easy and the necessary records and memoranda as to cost few. At present he supposed the bulk of estimates for insurance (except in the case of new buildings of which cost detail was at hand) were based upon a foot cube price, applied with more or less care and discrimination, though special buildings might be valued on rough approximate quantities, where, by reason of heavy rates of premium, any considerable margin for contingencies was inadmissible; or where, by reason of the magnitude of the risk, an error of judgment in determining an appropriate foot cube price would have very serious consequences.

The next point was the description of the property. It was important that careful consideration be given to the description of the premises, the precise information to be supplied to the office for the policy. Any surveyor arranging policies was responsible if they were useless, whether he was paid for the work or not. Material misrepresentation by the agent of the assured, whether due to fraud or to negligence, might be fatal to the policy; or if the assured, or his agent, accepted a policy without examination, the assured could not recover if the description could not be applied to the property burned, although the information and particulars were not supplied by him. The distinction to be drawn between mere representation and warranty was of great importance. It had been decided that there must be some element of fraud, wilful falsehood, or gross negligence in representations in an application for insurance before these would void a policy unless an express warranty was given; but if a representation was converted into a warranty by express stipulation it was then enforceable literally; good faith, or honesty of purpose would not excuse an error in such a case; the statements must be literally true or the warranty was not fulfilled. It was not always enough that the statements made were true; they must cover all facts material to the risk, and if they failed to state facts, which they should know to be material to the risk, the policy might be rendered null and void. It was well to remember that a representation of present condition and use was not, by itself, a continuing one or a warranty for the future, unless the intention of the parties was clearly manifest—*e.g.*, to a question, "How is the building warmed?" the reply, "No stoves used," was not a statement that there would not be any, nor did, "In the occupation of 'so and so,'" warrant that the premises would so remain. In cases of doubt the company should be induced to inspect the premises; their doing so would be a material factor. A question which often arises was: Is it needful to separately describe and insure outbuildings? His experience was that even when these were small a separate insurance was often asked for by the insurance company, and the printed conditions of the tariff offices required it where the buildings were detached, or, if adjoining, did not communicate internally, but he did not know of any English decided cases.

The author then considered the subject of additional risks during the currency of a policy. They were very various, but a few of the more common he referred to. (1) Building works, alterations, and repairs. When did notice become needful? He thought, so far as repairs are concerned, it might be said that "any increase of risk incident to the making of reasonable and necessary repairs is part of the general risk assumed by insurers," but that the safe rule was to notify building operations whenever the risk was thereby increased to any material extent. Fire insurance was very often loosely dealt with in building contracts. When the work consisted of substantial additions to existing buildings it was not without difficulty. The problem was to keep on foot the existing insurance, covering the additional

THE BUILDER, MARCH 15, 1902.

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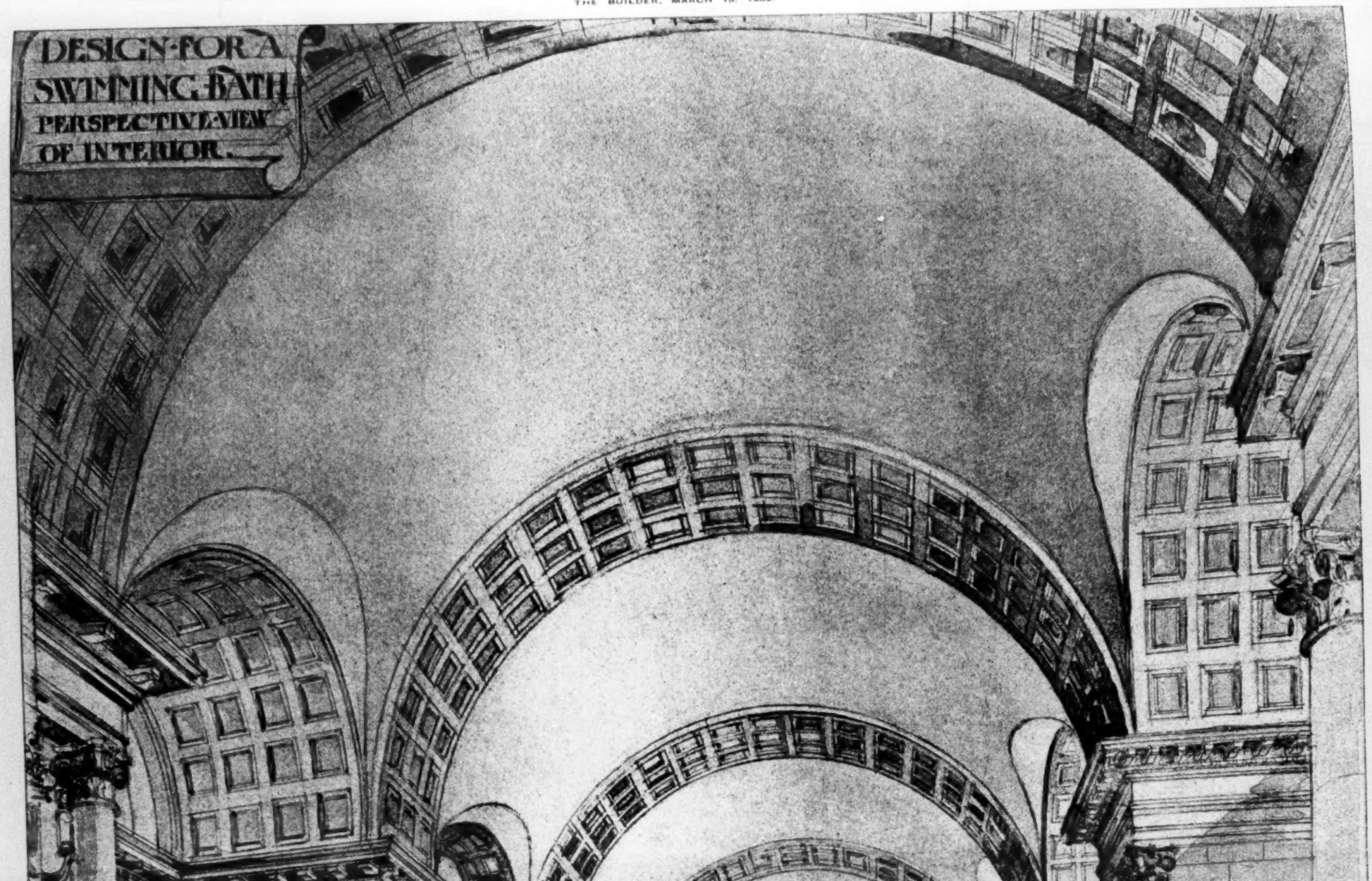
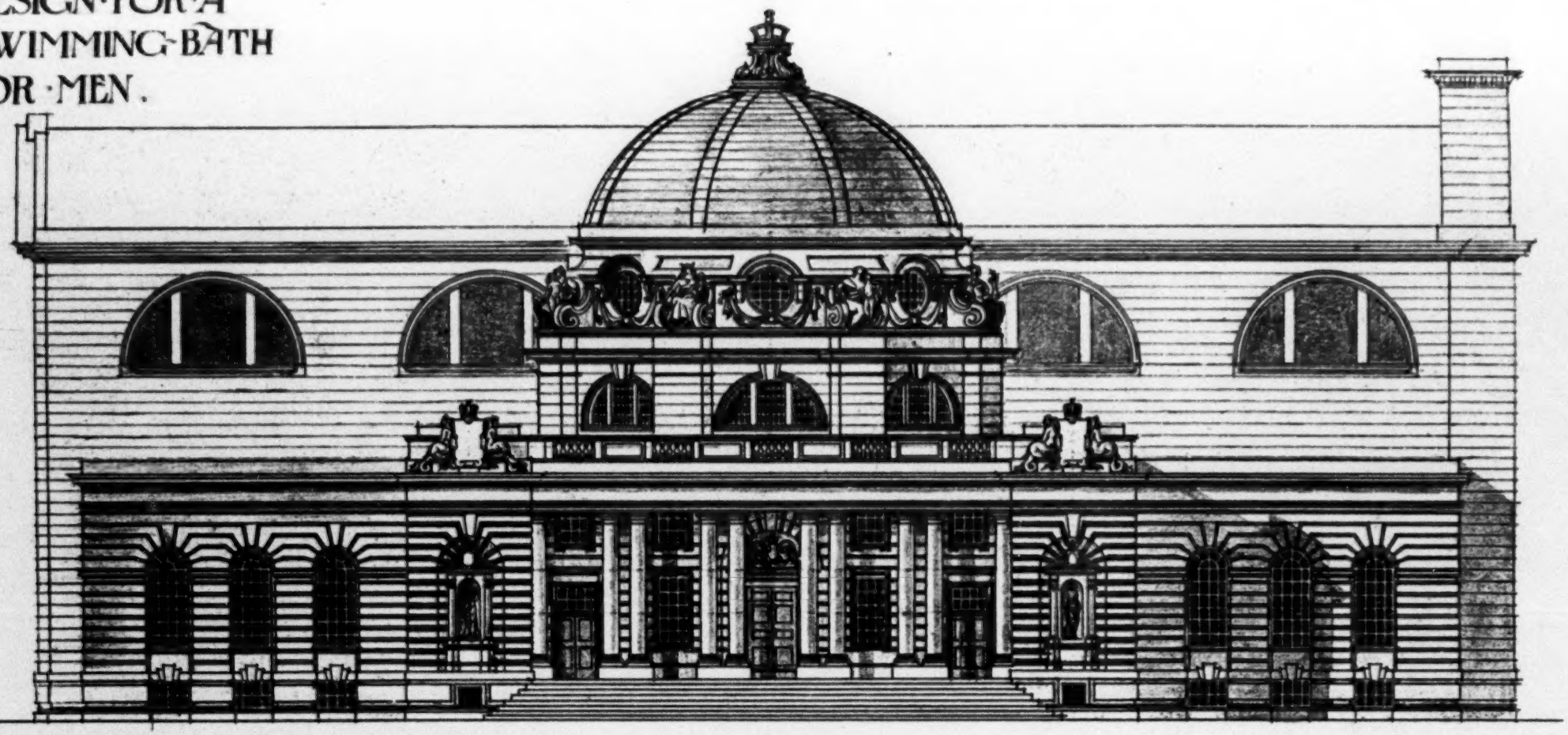

DESIGN FOR A
SWIMMING BATH
PERSPECTIVE VIEW
OF INTERIOR.

DESIGN FOR A SWIMMING-BATH.—By Mr. Lionel G. Detmar.

PERSPECTIVE VIEW OF INTERIOR.

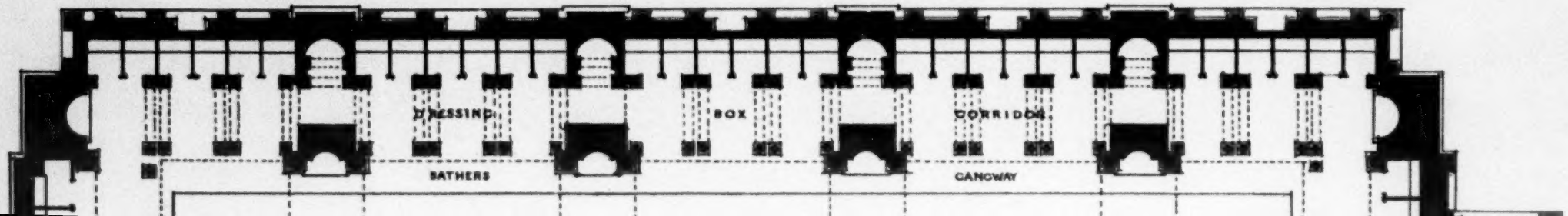
Soane Medal of Merit, R.I.B.A., 1902.

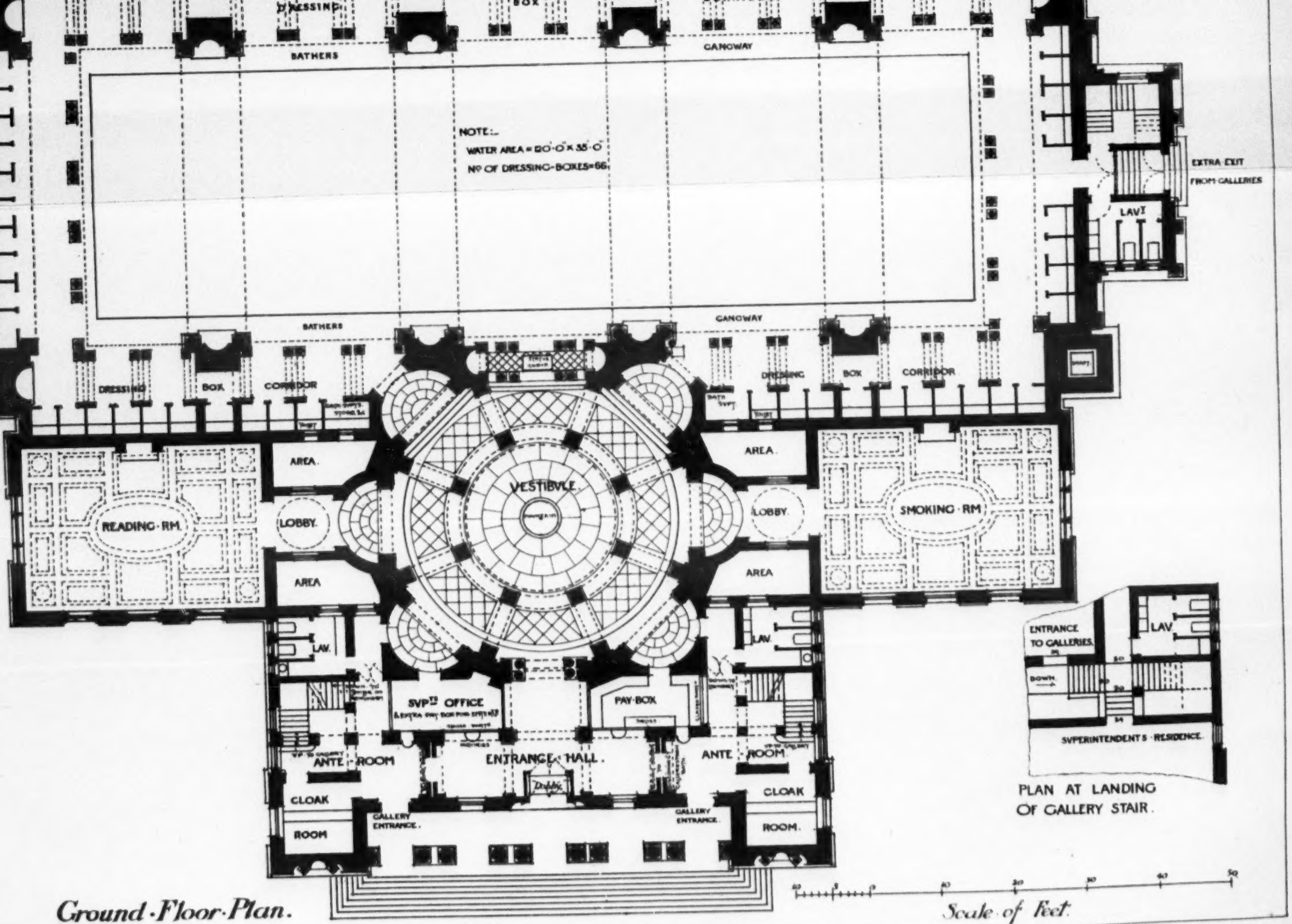
DESIGN·FOR·A SWIMMING-BATH FOR·MEN.



Front Elevation.

Scale of Feet.





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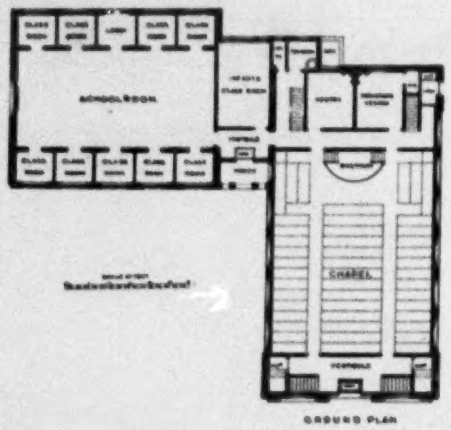
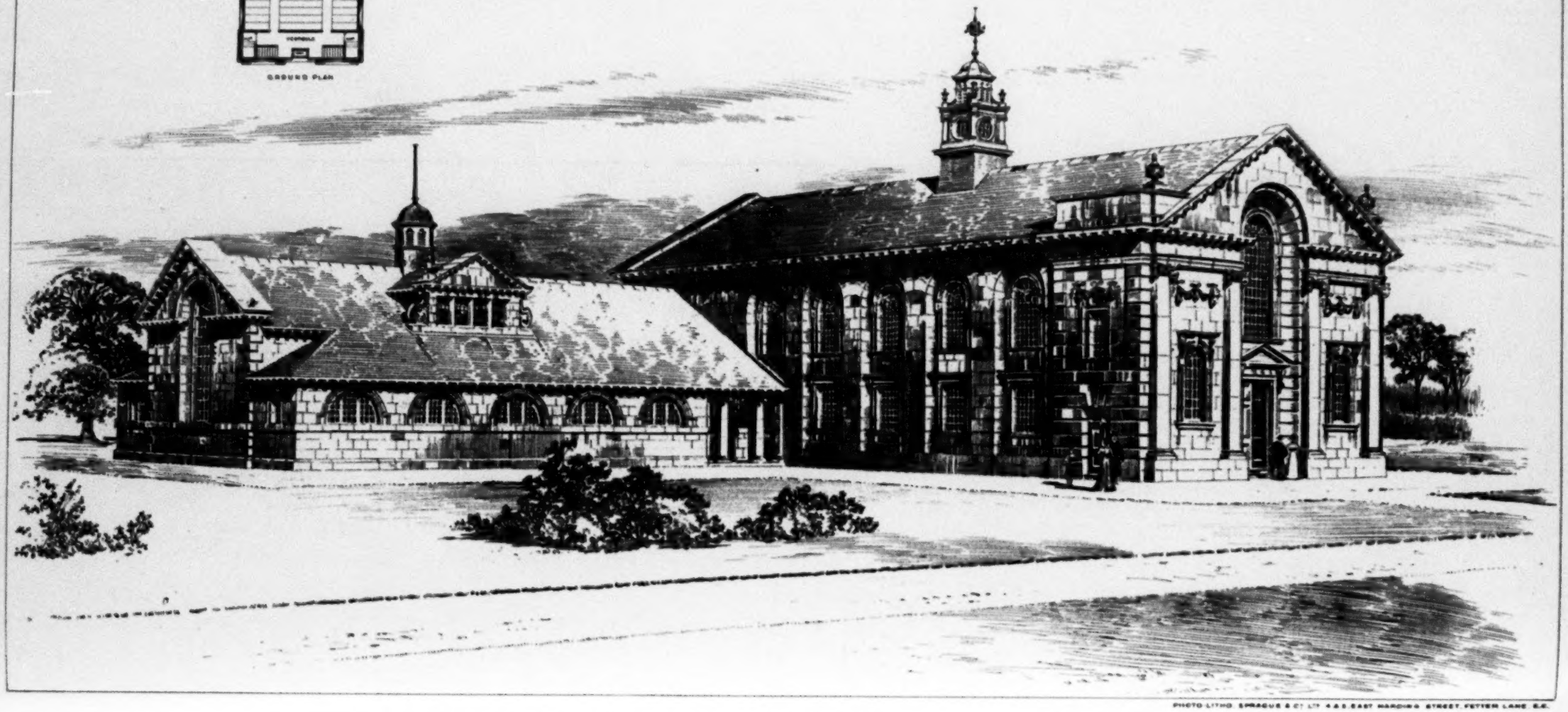
DESIGN FOR A SWIMMING-BATH.—By Mr. Lionel G. Detmar.

ELEVATION AND PLAN.



GROUND PLAN



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NEW BAPTIST CHAPEL AND SCHOOLS, TIVERTON, BATH.—MESSRS. SILCOCK & REAY, ARCHITECTS

PHOTO-LITHO SPRAGUE & CO LTD 4 & 5 EASY HARDING STREET, FETTER LANE, E.C.

HOUSE AT BUXTON.—Messrs. Chas. Heathcote & Sons, Architects

temporary risk, to cover the added value, and to this extent to protect the client and the builder who was under liability to complete the work. He had reason to know that in many cases the covering of the additional temporary risk on the old policy was altogether neglected, and an independent policy was taken out by the builder. Proceeding, the author said: "The second part of the insurance clause of the Royal Institute of British Architects' form of contract deals with cases of this kind, as follows:—

'The whole building and the works executed under this contract shall be at the sole risk of the employer as regards any loss or damage by fire, and in the event of any such loss or damage being so occasioned which affects the original building or structure, in addition to the new work, the contractor shall be entitled to receive from the employer the full value of all work then executed and materials then delivered, calculated in the manner provided for by Clause 13 hereof, and this contract, so far as it relates to any subsequent work, may, at the option of either party, be determined if in the opinion of the arbitrator such determination shall be just and equitable.'

This clause as it stands appears to me to be open to objection, because the contractor has no liability for insurance or responsibility in case of fire, and if such a clause is adopted it seems to me there should be a supplementary clause making the contractor responsible for doing or suffering nothing to vitiate the employer's policy. It is desirable, I think, in all cases, unless special circumstances prevent it, that the taking out of the policy, so far as the building works are concerned, should rest primarily upon the contractor, because he then is clearly aware of any stipulation made by the office, such as the absence of braziers for drying plastering, and he alone is in the best position to give any notices to the office as to such matters, and to comply with any requirements arising out of such notification, and this should be his responsibility. If, however, a builder takes out the necessary policy, might it result in his having an interest in the old buildings and an implied right to carry out their reinstatement? If so, it would be better, rather than to leave the insurance in the contractor's hands, for the employer to assume the responsibility of insurance and to make the builder responsible only if the insurance is invalidated by his act or default. The right to determine a contract in such a case on equitable terms would seem desirable, and in this respect the clause is a good one. I have seen it broadly stated that 'a fire happening on a building where a contractor is engaged excuses him from his contract,' but I do not know on what authority the statement rests, or the extent of its application. . . . The Royal Institute of British Architects Clause, Part I., relating to new buildings is a good one. The introduction of electric light requires the knowledge and sanction of the insurers. The regulations adopted by the Phœnix Fire Office are usually adopted by the other companies and are generally understood. The introduction of machinery and its motive power requires to be specially covered and the description to be full and accurate. Notice should be given and consent obtained before permitting the occupation of any premises for any trade known to be hazardous. . . . Apart from special condition or warranty alterations of user only void a policy in case the risk is thereby materially increased, which is a fact to be determined by a jury. The memorandum of trades, &c., added in a note to some conditions, give a clue to what occupations, &c., are, in the opinion of the offices attended by additional risk. . . . . The tariff office conditions usually confine notification of increased risk to the property insured, but some of the English, and many of the American, office policies require prompt notice of hazardous buildings near the subject of insurance or of the user and occupation thereof, just as some of them require notification of premises insured becoming unoccupied. The matter of the proximity of hazardous occupations is often a very serious one, and it seems strange that there should be no redress under circumstances such as these. A man may come and occupy premises adjoining my own and carry on a lawful but hazardous trade, and by reason of such business my insurance premium may be doubled or trebled. I am told that unless there is negligence or improper procedure on his part I have no claim or ground of action against him. . . . ."

The author then considered the happening of a loss and the settlement of the claims so arising, and some of the matters and circumstances which may complicate proceedings in a claim—(1) Effect of legislation; (2) Existence of other insurances, including "average" policies; (3) State of repair and age; (4) Fixtures.

"(1.) How to arrive at measure of damages when by reason of legislative enactments the subject matter of insurance cannot be reinstated on old lines. To take a concrete instance by way of example—a recent case of my own. A warehouse building was partially destroyed. It had two stories in the roof; the roof was at an angle of 60 deg. with the horizontal. By the Building Act of 1894 a warehouse roof must not exceed 47 deg. with the horizon (Section 61, Subsection 3). The result, if the roof were reconstructed, meant a loss of floor space on top floor, and loss of floor space with headroom on both floors. The contention of the assessor of the fire offices concerned was this: 'We will give you the cost of a new roof, and nothing more; if it cannot be replaced on the old lines that is not our fault, and our liability ceases when we have done what is lawful and possible.' I contended that this was not the case, but that in addition to the cost of such reinstatement as the law permits, the assured is entitled (if the amount of the policy is not exhausted) to an allowance for the less value the building will be to him when so partially reinstated. I based my contention to a considerable extent upon the old case of Alchorne *v.* Savill, 4 L. J. R. Chan. 47, a case of which the assessor had never heard, and the report of which he was, he said, unable to trace. I was ultimately, after consultation with the district surveyor, able to effect a satisfactory settlement, and the question had not to be further contested. I, however, sent to the assessor sufficient particulars of the case I had quoted, which he acknowledged, but did not discuss. . . . Then take another instance already alluded to, which raised, not only the question of less value of reinstated premises, but also the greater cost of reinstatement. The premises were used for purposes of trade and for dwelling also: The London Building Act requires in such a case a fire-resisting floor, a properly enclosed fireproof staircase, &c., neither of which existed in the old building. The Company's representatives say we do not profess to cover such a risk, because if a fire happens and the premises are rebuilt it would give the insured a better building than before, and if a fire happens we say, that the measure of our liability is the cost of reinstating on the old lines, and the insured must find the difference. It may be granted that the result is a more costly building, and in some respects more substantial, but not necessarily a more profitable building, often less so. I contend that, so far as the amount of the policy extends, the company should be, and, I think is, liable to comply with new requirements. . . . There is another indirect and contingent liability following upon fire, which should, perhaps, be referred to here. It is now, I believe, the custom of the London County Council in all cases of fire arising in manufacturing premises, to instruct the district surveyor to report what alterations ought to be made to the premises to comply with the general regulations of the Factory Acts 1878-1895, and following upon such report requirements more or less serious are made. One of these notices is at present before me. The owner of the building feels that but for the fire no such requirements would have been made, as only applying to buildings the construction of which is commenced after January 1, 1892, and thinks the cost of compliance should come out of the fire insurance. In this case, however, such a contention could hardly, I think, be justified, because the requirement is not in respect of the building *qua building*, but of the occupation of the building. It might be possibly a point for argument if the building were expressly insured by the insurance company as a factory for a particular business, but I should judge the case is too remote. There is another point which may properly come in here, as illustrating the difficulty of adjusting claims on account of legislative interference. The power of a district surveyor to make requisitions as the work goes on. Sometimes a district surveyor will go out of his way to assist you, and will say, 'I shall require so much of that wall to come down,' and 'that wall may remain if you put such and such piers'; but sometimes a district surveyor will decline to determine until pulling down proceeds, and the surveyor claiming has either to claim for work which may not be required or run the risk of accepting an amount which may hereafter prove inadequate. . . . . I am aware that after a claim is adjusted, but before it is settled, the insured may prove that he has left something out of his claim, and the adjustment would not be binding, but would this be so if the money had actually been paid and accepted in discharge? The companies cannot in such a case get back money paid in mistake. Is the insured in any more favourable a position? . . ." In reference to the age and state of repair the author said:—"It is argued, I believe, by some assessors that this clause: 'The value at the time of the fire of the property destroyed' permits the offices to deduct from the amount of ascertained loss such a sum as would represent either the depreciation in value by reason of the age of the building, or such a sum as would have been required at the time of the fire to put the property destroyed into thorough repair. It has even been contended that an annual depreciation percentage should be taken into account, but I think that unless distinct actual and substantial detriment can be shown no such deduction is claimable. . . . On the other hand, if the property insured is a worn-out and very dilapidated building, the insured is, of course, not entitled either to the original cost, or the sum needful to erect a new one. The case of Yates *v.* Dunster (24 L.J. Ex. 226, April, 1855) was an action for damages against assignee under covenant to repair. The jury found that 1,635*l.* would be the cost of rebuilding, but that the new building would be worth 600*l.* more than at the time of the fire; 84*l.* had been expended to meet the district surveyor's requirements, 1,000*l.* was recoverable under an inadequate policy. The result of the case was judgment against the assignee for 119*l.* = 1,635*l.* + 84*l.* (1,000*l.* + 600*l.* [the surplus value of the new building]). As to ordinary repairs, such as the need for a coat of paint, if these were not so material as to make the property of substantially less capital value, I doubt whether they can be taken into account. A question sometimes arises where a building, though substantial, is old and unsuitable for its locality. The value of the building *quâ* structure may be considerable, but its value as it stands viewed as an earning property may be small, and the building and site together, little more than the value of the site itself. It has, indeed, been contended that in such a case the excess of value over the value of the cleared site is the criterion and measure of damages, but this is, I think, an erroneous view, and that if the office elects not to reinstate, the claim is the actual value of the building, and not its relative value. The office has nothing to do with the question how the insured applies the money paid to him. The state of repair sometimes increases the responsibility of the company. I had a case a little time ago where a fire occurred in an extensive stable loft, the front wall of the building had been dragged out of the perpendicular by the erection of a heavy pent roof which had been tiled. The only thing which held the premises together was the existence of certain bond timbers which had been bedded into the cross walls. Some of these had been utilised to form the fixing for straps and iron plate washers to hold the front up. Some of these bond timbers were badly charred by the fire. The company contended that their liability only extended to replacing them, and that if in doing so the District Surveyor condemned the structure or declined to allow them to do so they were not responsible. I contended that but for the fire no such question would probably have arisen, and they must either reinstate the ties themselves and the burnt woodwork or pay a sum sufficient to cover the cost of the work, and to satisfy the District Surveyor. The company carried out the reinstatement, rebuilt the upper part of the wall, and reconstructed the pent roof, and, I think, they could have been compelled to do this." As to fixtures, the author said:—"Questions often arise as to how far the policy of insurance on premises covers the fixtures therein apart from express description. It will, no doubt, depend largely upon the wording of the policy, and in most cases the policy would give some indication of intention. Thus, where premises were insured as a starch manufactory, it was considered that it would include fixtures necessary to the process carried on. Similarly a mill.

As to business premises generally such items as shelves and counters would probably depend upon the question whether they are movable or immovable fixtures. Take the case, for instance, of licensed premises. The trade fittings should, in my opinion, clearly be insured in a separate policy unless they belong to the freeholder of the premises." He then referred to one or two specific points of some importance, to be borne in mind in negotiation with an assessor.

"(1) *Total loss.* A total loss does not mean the annihilation of all the materials, but the destruction of the premises insured *as a building*. . . . . (2) *The company's right or obligation to reinstate.* The companies now, for the most part, reserve to themselves the option to pay or to reinstate; but it was not always so. In the early days of insurance the option was sometimes mutual, and sometimes the insured had to elect, on taking out the policy, whether, in case of a loss happening, the company should pay or should reinstate. Under certain circumstances they can be compelled to reinstate. The Act of 14 George III., cap. 78, is still in force as to Section 83, and it requires the insurance company, upon the request of any person interested in or entitled unto any house or houses or other building which may be burnt down, demolished, or damaged by fire, or without any such request and upon any grounds of suspicion of fraud or arson, to cause the insurance money to be laid out and expended, so far as the same will go, towards rebuilding, reinstating, or repairing. As an alternative, there is a provision for the insured to give approved security for the due expenditure of the money. . . . . It is to be borne in mind that the companies' election to reinstate may involve them in serious responsibility not even to be measured by the total amount of the policy of insurance. For instance, if partial reinstatement is effected, the measure of damage is the cost of completion—irrespective of the amount of the balance of the policy, and in view of this fact it is not surprising that the companies do not often take advantage of this particular option. The election to reinstate makes the company liable for damages as for breach of a contract to build, and if the company having elected to reinstate the authorities make requisitions, involving extra outlay, still the company must comply or pay damages, not only for failure but for delay. There is a very strong case as to this—Brown *v.* Royal Insurance, Ellis *v.* Ellis, 853, where the authority condemned the building as dangerous and required it to be taken down. The company was held not to be relieved from liability, although the dangerous condition of the building was not caused by the fire. One of the judges dissented in this case, because he considered the company could not be made to give improved premises, but the view of the majority was that the company was bound by its election, and if the performance had become impossible or (which was all the company had shown) more expensive than was anticipated, still it must either perform the contract or pay damages for not performing it. I should be glad to know whether the company's right to reinstate ceases as soon as any steps are taken with a view to arbitration. It would be very desirable if the duration of the option on the company's part were generally determined by policies, as it is by some; for it must be remembered that so long as there is this option the insured must not proceed to execute repairs himself, or if he does he cannot recover his expenditure from the company. When under conditions of policy the insurance money is payable a certain number of days after loss, the company's option ceases at such date as a right of action then accrues. It may so happen that the company may proceed to reinstate, and may by mistake alter the premises, if so, it is the company's responsibility. To meet this difficulty in the conditions of some offices (*e.g.*, The Sun) 'there is a provision that the insured shall at his own expense supply or produce all plans, specifications, measurements, documents, books and information requisite to a reinstatement. Reinstatement being thus attended with serious responsibility it is not lightly entered upon by the companies; they will usually fall back upon arbitration procedure. The principle of arbitration in these matters goes back to the year 1727. In the form in which the condition now usually appears, the obtaining of an award is a condition precedent to a right to recover unless the company deny *in toto* the right of the insured to recover. I consider that the condition which in some companies' policy form provides that the costs of an arbitration, including the arbitrator's award, should be equally borne by the insured and the company is a most onerous and one-sided one. The costs of an arbitration are a very different matter to a wealthy company, as compared with what they would be to a private individual insurer, and I consider that in all cases the costs should be in the discretion of the arbitrator. . . . Assuming a deadlock in negotiation, who is responsible for the building? I think the company is, and if delay occurs on their part and damage occurs to adjoining premises, that they are responsible. I suppose, also, they are responsible if any damage arises to the public after a fire, and for the adequacy of shoring if the buildings are in their charge. . . ."

In conclusion, the author suggested the following for consideration:—

"1. The encouragement of fire-resisting construction by preferential rates, and the issue by all offices of information as to matters which, in their opinion, increase risk, and therefore premiums, and of such as would minimise risks. The encouragement of fire-proof construction by preferential rates differs from, and is the converse of, one object of the tariff system, which is defined as being to affix 'such a penalty to dangerous constructions, substances, and processes as to induce, if possible, a lowering of the danger.' Nor does the issue of revised rules for standard fire-resisting buildings, though a commendable and most useful step, go far enough to meet the requirements of the case.

There are, as Mr. Douglass Mathews pointed out in a recent volume of *Professional Notes*, very numerous cases where a standard fire-resisting construction is considered prohibitory, but where, short of that, many reasonable precautions and expedients could be adopted; and it seems to me it would, as he pointed out, be a very useful thing if it were the general practice to submit plans of buildings likely to be the subject of exceptional rate of premiums, before those buildings are erected, to a surveyor appointed by the companies, or some of them, for that official to make suggestions with a view to reduction of risk, coupled with the understanding that in the event of his suggestions being adopted he would report to the company in whose office it might be proposed to insure the building the extent to which the ordinary rate for a building of the class in question might reasonably be modified in consideration thereof. As matters now stand there is often great dissatisfaction because adequate allowance does not seem to be made for what is done in the direction of fire-resisting construction or automatic apparatus. The more frequently such a procedure is adopted, the sooner would, I think, office and clients alike find in it a mutual advantage, because clients are much more likely to incur expenses in this direction if the suggestions are practicable ones and are coupled with a definite prospect of material reductions of rate. It can hardly be said that the time is not ripe for such a step. The accumulated experience of the offices, and the accumulating results of numerous experiments by the Fire Prevention Committee, surely afford a basis for the practical discussion of such a scheme.

2. A definite pronouncement of the companies' intentions as to matters as to which at present uncertainty may exist, such as the covering of all losses and expenses other than of profits, falling upon a building-owner arising beyond his control, and the definite insurance of all such bonâ-fide losses.

3. The giving by the companies of at least fifteen days' notice of their intention to decline to renew a policy involving a risk hitherto insured and about to expire. It is often difficult to cover, at short notice, a hazardous risk, and if it is a fact, as I believe it has been decided to be, that no claim arises against an insurance company by the operation of the 'days-of-grace' provision in a case in which the company have notified their intention not to renew, a reasonable and defined notice, it seems to me, ought to be incumbent upon the company. . . . I think it might be argued that it is to the interest of the community that manufacturers should be able to insure themselves at rates which, while necessarily high for dangerous processes, are not absolutely prohibitive, and certainly that the risks which cannot be covered, if any, should be few. If so, then has not the community a right to look to the companies for consideration of the subject, not from the companies' standpoint alone? I think it has, and also that if the companies are as wise as they are powerful they will heed the signs of the times. The large expenditure made by the community in the maintenance and improvement in the efficiency of fire brigades, and also in compliance with more stringent enactments made with a view to decreasing the risk and extent of fires, demands some return from the offices who benefit so directly by such expenditure, and there is a widespread view that this demand is not met. One point in connexion with the recent appeal to the City Corporation struck me as very forcible, viz., that as compared with 1865, when the contribution now payable by the offices to the County Council for fire brigade purposes was fixed, the proportion of fires reported as serious and involving considerable loss has fallen from 25 per cent. to between 3 and 4 per cent., and this although conflagrations are at present reported as serious which would not have been so described thirty years ago. . . ."

Mr. Howard Martin proposed a vote of thanks to the author for his excellent paper, and Mr. Douglass Mathews seconded, and also moved the adjournment of the discussion. The vote of thanks and the motion to adjourn having been agreed to, and Mr. A. B. Hudson having made a few remarks, the discussion was adjourned until the 24th inst.

CARPENTERS' HALL LECTURES.

THE subject selected by Professor Ramsay, F.R.S., for his lecture at the Carpenters' Hall on the 6th inst., was "The Bearing of Modern Chemical Theory on some Problems connected with the Building Trade." The lecturer observed that the massive walls of buildings which are usually regarded as essentially solid, are in reality largely composed of liquid and gaseous matter, for all descriptions of stone, brick, and mortar contain considerable quantities of water, and are permeated with innumerable pores or channels filled with gases and water vapour.

The investigations of Dr. Horace Brown into the rate of flow of gases through the perforated cap of a cylindrical vessel were described, and it was stated that the rate of flow is not proportionate to the area of the orifices in the cap, but is proportionate to their diameters. A remarkable fact revealed by Dr. Brown's experiments was that gases flowed into, or out of, the cylindrical vessel more rapidly when it was covered with a cap having a large number of small orifices than when the top of the vessel was left entirely uncovered. A practical application of this scientific discovery is seen in the provision of perforated plates or baffles over chimneys to prevent downdraught. The rate of flow of the combustion products escaping from the chimney is increased by the presence of the perforated plate, and the interior of the chimney is at the same time protected to a certain extent from the action of gusts of wind.

Adopting a favourite phrase of the ancient philosophers, "Nature abhors a vacuum," Professor Ramsay said that liquid and gaseous matter always has a tendency to flow into a vacuum, or into a space devoid of similar matter. It was shown that a bladder filled with gaseous carbonic acid gradually collapsed because the atmosphere in which it was suspended was practically devoid of carbonic acid, and the attraction of the gas towards the vacuum was sufficiently strong to cause carbonic acid to flow through the walls of the bladder. The same bladder filled with air would not collapse, because the air or gaseous mixture by which the bladder is surrounded, being of the same composition as the contents of the bladder, would not act like a vacuum.

A large proportion of the surfaces of bricks and building stones consists of the open ends of irregular channels, and the irregularity of these channels interferes with the laws which govern the rate of flow, but there is nevertheless a perpetual flow of gases and water vapour through these channels. When the external air is drier than that within a building, the damper air from the building flows through the walls into the atmosphere and tends to dry the building. When the external atmosphere is damper than that within the building the water vapour flows through the walls towards the drier air (or partial water vapour vacuum) and tends to make the building damp.

In a new building the water and soluble salts contained in the material used for construction flow to the surfaces of the walls, where the water evaporates and leaves the salts in the form of a white efflorescent deposit. The escape of water vapour from stone or brick is aided by the flow of dry gases.

Professor Ramsay said that it is a common practice to attempt to hasten the drying of new buildings by leaving the doors and flues open, but he thought it would be more rational to close these vents, and to use charcoal braziers in the closed rooms. The hot gaseous carbonic acid evolved from the burning charcoal would flow through the walls, and the carbonic acid would materially accelerate the conversion of the lime in the mortar into carbonate of lime. The rate at which the lime in mortar is converted into carbonate of lime increases with the temperature, and the passage of the hot carbonic acid through the walls would therefore not only dry out the water but would increase materially the rate of conversion of the lime into carbonate of lime.

Dr. Kennedy, F.R.S., who occupied the chair, in proposing the vote of thanks, which was cordially given to Professor Ramsay, aptly summed up the lecture by saying that Professor Ramsay had demonstrated that the substances which practical architects and builders are accustomed to regard as sound and solid building materials consist merely of a combination of holes.

THE LONDON COUNTY COUNCIL.

THE statutory annual meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, the retiring Chairman, presiding.

The New Chairman.—Earl Carrington proposed as Chairman for the ensuing year Mr. J. M'Dougall, whom he eulogised as a man of great capacity and industry, genuine modesty, and blameless life. The Council offered him the chair as a reward of faithful services in the past.

Mr. Hubbard seconded the motion, which was supported by Mr. Campbell, and carried unanimously.

Mr. Torrance then vacated the chair, which was taken by Mr. M'Dougall.

On the motion of Mr. Cornwall, seconded by Sir A. West, Lord Monkswell was elected to the vice-chairmanship.

Mr. Alliston moved, and Mr. Dodson seconded, the election of Mr. H. Clarke as deputy-chairman, which was duly carried.

A New County Hall.—On the Council proceeding to the election of the Committees for the ensuing year, Colonel Rotton moved that the Special Committee on New Offices be not appointed, and that the reference to that Committee be transferred to the Establishment Committee. He remarked that it was impossible for the Council to obtain any information with regard to that Committee, and they appeared to be no nearer obtaining new offices than they were twelve years ago.

Mr. Beachcroft, in seconding the amendment, pointed out that they had now a staff of 805 scattered about, and, although the Special Committee had been appointed two years, they had not yet reported.

Mr. Pigott observed that the cause of delay was because both parties "funked" spending 2,000,000*l.* of money on new offices.

The amendment was defeated, and the Committee elected.

It was agreed, on the motion of Mr. Crooks, that the Committee be instructed to bring up a Report before the Whitsuntide recess.

The Forthcoming Rate.—Lord Welby said that, many inquiries having been made, on behalf of the Councils of the Metropolitan Boroughs, as to the probable amount of the County rate for 1902-3, he was authorised by the Finance Committee to state that, so far as could at present be foreseen, and subject to further consideration by the Committee and to consideration by the Council after Easter, the rate would probably be 15½d. in the pound, viz., 12¾d. for general county purposes and 2¾d. for special county purposes. This rate would be an increase of ½d. upon the rate of the present financial year, and he might say generally that the increase was accounted for by the larger annual charge for interest and repayment of debt.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council 4,800*l.* for the purchase of property for a wharf and cottages in Norman-road; Stepney Borough Council, 4,250*l.* for contribution to cost of street improvements; Woolwich Borough Council, 1,350*l.* for electric light installation; Camberwell Borough Council, 35,000*l.* for purchase of land for a cemetery; Stoke Newington Borough Council, 2,000*l.* for contribution towards cost of purchase of Alexandra Park; Camberwell Guardians, 13,210*l.* for erection of homes for children; Holborn Guardians, 2,500*l.* for provision of steam-boiler plant; and St. Marylebone Guardians, 4,240*l.* for purchase of premises.

Camberwell School of Arts and Crafts.—The Technical Education Board recommended the Council to take on lease from the Camberwell Borough Council the premises of the local school of arts and crafts, including new buildings to be erected by the Borough Council, at a rent not exceeding 300*l.* a year, for a term of years from seven to sixty, at the option of the County Council.

The solicitor was instructed to make the necessary arrangements.

London University.—On the motion for the reception of the Report of the Technical Education Board, dealing with the reorganisation of the University of London, Mr. Macdonald called attention to the growing relationship between London Polytechnics and London University, and such a relationship was, he believed, opposed to the best interests of technical education. He contended that polytechnics should be organised and controlled from the point of view of the workshop, and not from the point of view of the University. What they wanted was to increase schools of craftsmanship, and not increase the number of Bachelors of Science and Doctors of Science.

Dr. Napier believed that in London there were greater facilities for workmen to educate themselves in their trade than in probably any town in the world.

Mr. Sidney Webb said it was absolutely untrue that craftsmanship had been neglected by the Technical Education Board. The first of the greatest works of the Board had been the multiplication and extension of craft classes. With regard to the London University, all the old facilities would be maintained for the education of those who were not wealthy.

The Report was adopted.

Widening of Piccadilly.—The Improvements Committee submitted a report on the suggested widening of Piccadilly between the Circus and Sackville-street, and gave the correspondence which had taken place between them and his Majesty's Commissioners of Woods and Forests, who are the freeholders of nearly the whole of the property which would have to be acquired for the improvement. The Committee pointed out that they have not succeeded in inducing the Commissioners to assist the Council in securing a much-needed improvement at anything but prohibitive cost, and they could not advise the Council to embark on an expenditure of 250,000*l.*, which it would entail. They recommended, "That in the absence of any undertaking from his Majesty's Commissioners of Woods and Forests to co-operate with the Council for securing, upon the expiration of the leases, and at reasonable cost, the setting back of the buildings on the Northern side of Piccadilly, the widening of that thoroughfare to 80 ft. between the Circus and Sackville-street be not undertaken by the Council."

Mr. Davis (Chairman of the Committee) said the Committee felt the improvement was a very important one, but they could not recommend it unless the Commissioners were prepared to assist. Under the circumstances they thought it better to bring the matter before the Council, in order that greater pressure might be brought to bear on the Commissioners.

Captain Hemphill hoped public attention would be drawn to the subject, so that the Commissioners might be influenced.

The motion was adopted, and it was resolved to communicate the decision to the First Lord of the Treasury, the Commissioners of Woods and Forests, and the Westminster City Council.

Belgian Rails.—In answer to Mr. Cousins, Mr. Benn said the Council had power, and there was no reason why the rate of pay and hours of labour should not be put in the tender of Messrs. Maclellan for the tramway rails to be made in Belgium.

Eltham Park.—The Improvements Committee recommended an expenditure of 9,350*l.* in the purchase of forty-one acres of the Eltham Park estate for the purposes of a public park, on the understanding that half the amount will be contributed by the Woolwich Borough Council. The cost of laying out the park was estimated at 10,000*l.*, and the annual maintenance at 2,000*l.*

The Report was adopted.

London United Tramways Bill.—The Highways Committee recommended that the Council should consent to the introduction of this Bill, provided it were limited to the construction of two short lengths of tramway at Hammersmith, which should be constructed by the Council, and become purchaseable by them in 1909. The report explained that a concession had been made to local feeling, as expressed by a petition and deputation, these short lines being required for linking-up purposes. The Committee's proposals were agreed to.

Roads and Sewers, Totterdown Fields Estate.—The Housing of the Working Classes Committee recommended that the expenditure of a sum not exceeding 9,000*l.* in respect of the sewer and temporary paving works on Section B of the Totterdown-fields estate be sanctioned; that the offer of Mr. F. J. Coxhead to carry out the work at the same schedule of prices as that on which his tender for similar works on Section A of the estate was based be accepted.

This was agreed to.

Furnished Rooms Let by Keepers of Common Lodging-houses.—The same Committee reported as follows:—

"The medical officer, acting under our instructions, has caused inquiry to be made into the number of furnished rooms let by keepers of common lodging-houses in London, and into the circumstances of the population inhabiting them. These rooms are usually situated in the neighbourhood of the common lodging-houses, and are let to persons requiring such accommodation. There were found to be 809 such rooms, 744 of which were let as single-room tenements, twenty-five as two-room tenements, and five as three-room tenements. These were occupied by 1,015 people, of whom 1,345 were parents or heads of families, and 428 were children under ten years of age. The total number of women was 704, of whom 619 had husbands living with them and 85 had not. The comparatively small number of children belonging to persons occupying these rooms is probably accounted for by the fact that many of the owners of the rooms either refuse to let to families with children, or only let to families with a limited number of children. The rents of the rooms varied, but 5*s.* or 6*s.* per week may be regarded as a common price for the single-room tenements. The furniture of the rooms is generally of a poor and meagre description. The inspector inquiring in the district of Stepney found instances in which the inmates, though paying for furnished rooms, possessed furniture of their own, but had adopted this course owing to the scarcity of unfurnished rooms. The dearth of accommodation is further evidenced by the small proportion of rooms vacant. Thus, at the time of inspection, in Stepney only seven rooms were found temporarily vacant out of more than 300 rooms visited. Several of the owners of rooms in this district stated that if they possessed double the number of rooms they could easily find tenants. The tenants occupying the furnished rooms did not appear to be migratory in the same way as many of the tenants of common lodging-houses. Thus in numerous instances the tenancy had extended to many months or even to two or three years or more. . . . ."

Repairing Carriageway, Westminster Bridge.—The Bridges Committee recommended, and it was agreed, that, subject to the passing of the annual maintenance votes, the Council do sanction the expenditure by the Bridges Committee of 4,300*l.* for repaving the carriageway of Westminster Bridge; that the offer of the Improved Wood Pavement Company, Limited, to execute the work be accepted.

Ground Plan of London—Detail Section.—The Corporate Property Committee reported as follows, their recommendation being agreed to—

"In connexion with the compilation of the ground plan it became necessary to survey some portions of London which had been developed since the ordnance survey in 1891, and as it was evident that more work of this kind would have to be executed in order that the several boundaries of estates might be defined, we were authorised to augment and extend this part of the work. Further, having regard to the long intervals between the revision of the ordnance survey it was felt that, if the sheets were made up to date and kept up to date, they would be made use of by solicitors, architects, surveyors, estate agents and others who could be furnished with a tracing of any particular property upon payment of fees to be hereafter determined, and in this way the work would become a means of revenue. For the sake

of convenience, the ground plan work has been divided up into two sections, viz., the ownership and detail sections and the expenditure kept separate. The Council has already sanctioned the completion of the ownership section by March, 1904, at a total cost of 8,000*l.*, but with regard to the detail section has only sanctioned an initial outlay of 550*l.* for bringing the work up to idate, together with an annual expenditure of 200*l.* for keeping it up. The amount of work involved in the making up has been so much greater than was anticipated, that the valuer, basing his calculations upon the work done during the last three years, estimates the further cost at 500*l.* To show the whole area of London, 541 five ft. ordnance sheets are necessary, and on 236 of these the work of making up has been entirely completed, and partially finished in the case of 150. We feel that the keeping up to date of the 5 ft. ordnance survey must prove a great benefit to the public at large, while the value to the Council of such a plan will more than justify the increased cost. We recommend:—"That, subject to the passing of the annual maintenance votes, the Council do sanction the bringing up to date of the detail section of the ground plan at the estimated further cost of 500*l.*"

Annual Map of London.—They also submitted the following report:—

"This map, which will show the progress of building operations in London from year to year, was referred by the Council to us to prepare in connexion with the ground plan. The necessary expenditure incurred in its preparation is provided for by the Local Government Committee in their estimates. . . . It will also be useful to the Council for the purpose of fixing sites for new fire-stations, &c., and in arranging polling districts. This map and its completion is dependent upon that of the detail section of the ground plan. Now that another financial year is about to commence, it becomes necessary for the approval of the Council to be obtained to an expenditure of 380*l.* during the twelve months ending March 31, 1903. We recommend—That, subject to the passing of the annual maintenance votes, the Council do authorise the further expenditure by the Corporate Property Committee of 380*l.* (included in the Local Government Committee's estimate) in connexion with the annual map of London during the year ending March 31, 1903."

The recommendation was agreed to.

The Council adjourned shortly before eight o'clock.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the Architects' Benevolent Society was held on Wednesday at No. 9, Conduit-street, Regent-street, W., Mr. J. Macvicar Anderson presiding in the absence of the President, Mr. William Emerson.

The minutes of last meeting having been read and confirmed, Mr. Percivall Currey, hon. secretary, read the annual report, as follows:—

"At the last annual general meeting of the Architects' Benevolent Society the President announced that, owing to the pressing calls on the Society, the income account for the year showed a deficit of over 40*l.*, and that, in consequence, many cases had only been inadequately relieved. The President's statement called forth from Mr. Macvicar Anderson an offer to contribute 100*l.* to the funds of the Society if nine or any number of other donors would contribute sums so as to make the total amount 1,000*l.* Mr. Anderson supported his offer by making a special appeal to a few personal friends, with the result that more than the necessary sum was cordially and promptly subscribed. The President, Mr. Wm. Emerson, also brought the objects and position of the Society before the attention of the Royal Institute of Architects of Ireland and of the Societies allied with the Royal Institute of British Architects; and your Council have the satisfaction to report that donations or increased subscriptions were received from the Royal Institute of Architects of Ireland and the Aberdeen, Liverpool, Nottingham, Manchester, and Devon and Exeter Societies. The Council desire cordially to thank Mr. Macvicar Anderson and the President both for their generous contributions and for their individual efforts, by which they have so materially increased the prosperity of the Society. Thanks are also due to Mr. J. T. Christopher, to whose kindly intercession a donation of 21*l.* from the Worshipful Company of Salters is due. . . .

In consequence of the amount standing to the credit of the capital account—1,310*l.* 16*s.* 4*d.* having been received in donations and 1,500*l.* under the provisions of the will of the late Mr. Arthur Cates—purchases were effected during the year of 430*l.* Caledonian Railway 4 per cent. debenture stock and 2,606*l.* 7*s.* 5*d.* 2½ per cent. Consols.

The increase of late years in the amount received in subscriptions has been steadily maintained, the total amount being 563*l.* 1*s.* 6*d.*, as against 522*l.* 0*s.* 6*d.* received in 1900. The growth of the Society's income has, however, been accompanied by increasing claims on its resources, and 813*l.* was distributed in pensions and grants during the period under review, as against 790*l.* expended in 1900. Out of the fifty-six applicants for relief, twenty-two were from Ireland and the provinces. It will be observed, from the accompanying statement of accounts, that the income account shows a deficit of 28*l.* 18*s.* 10*d.*

The Council have had under consideration the desirability of altering two of the by-laws. It is proposed to alter the wording of By-law No. 55 so as to bring it under the powers of the Trustee Act of 1893, by which the field open to the Society's investments may be enlarged without jeopardising the value of the security. In view of the additions to the capital account it is proposed to alter By-law 65, so as to increase the number of pensioners from six to ten. If this is carried into effect it will materially add to the happiness of a few of those who are dependent on the Society for yearly grants, by removing the feeling of uncertainty necessarily attached to this form of relief. Resolutions embodying the proposed changes in these by-laws will be submitted to you.

The Council desire to commend to your attention a proposal made by a subscriber, who has himself carried it into practical effect—viz., that the odd shillings received in fees by architects acting in arbitration cases should be presented to the Society.

It is with great regret that the Council record the irreparable loss sustained by the Society in the death of Mr. Arthur Cates. Mr. Cates was on many occasions a member of the Council, a position which he occupied at the time of his death. He acted from 1891-96 as the Society's treasurer, and its present financial stability is largely due to his exertions during that period; and he was one of the Society's trustees. Mr. Cates's interest in the Society was sustained until the last, and the handsome bequest of 1,500*l.* from one so familiar with its practical affairs is, your Council feel, both a testimony to the Society's usefulness and its needs.

The Council have also to record with great regret the death of an old subscriber and member of the Council, Mr. E. H. Martineau, and of Mr. J. M. Brydon, who had liberally responded to Mr. Macvicar Anderson's appeal.

The Council desire to nominate Mr. Aston Webb, A.R.A., for election as trustee to fill the vacancy caused by the death of Mr. Cates.

The following gentlemen, being the five senior members, retire by rotation from the Council:—Mr. T. M. Rickman, Mr. R. A. Briggs, Mr. Arthur Cates (deceased), Mr. E. A. Gruning, and Mr. G. T. Hine. To fill these vacancies the Council beg to nominate:—Mr. F. T. Baggallay, Mr. J. J. Burnet, Mr. J. H. Christian, Mr. R. St. A. Roumieu, and Mr. George Scamell.

The balance-sheet and income account for the year ended December 31, 1901, audited by Mr. J. T. Christopher and Mr. Henry Hall, are herewith submitted.

The Council of the Royal Institute of British Architects have granted office accommodation; and Mr. Locke and the other officials have been invariably helpful in any matter connected with the Society—services which are cordially recognised and appreciated."

The Chairman, in moving the adoption of the report and balance-sheet, said that the report was, he thought they would agree, satisfactory, but it recorded the death of one of whose loss the Council rightly used the word "irreparable," *i.e.*, Mr. Arthur Cates, who not only gave liberally to the Society, but devoted so much time and thought to its welfare. Two others had also passed away, *i.e.*, Mr. Martineau and Mr. Brydon, the death of the last-named being particularly sad. As to the finances, they must all feel gratified at the improvement of affairs, but he thought they should not rest satisfied. They must press on and do better, and still further improve the position of the Society. The income was not as satisfactory as it ought to be. The expenses of the Society were comparatively small, owing, to some extent, to the Institute giving them the use of their offices. A suggestion had been made as to increasing the income, and he would suggest that when an architect got anything like an important commission he should give something as a thank offering to the Society. If that were done it would result in a considerable increase in the funds of the Society.

The motion having been agreed to, and a vote of thanks accorded to the retiring members of Council (Messrs. T. M. Rickman, R. A. Briggs, E. A. Gruning, and G. T. Hine), Mr. T. M. Rickman moved that the members of Council for the year of office 1902-1903 be elected as follows:—Messrs. Zeph. King, G. Inskipp, J. T. Wimperis, Arthur Green, E. Monson, Sydney Smirke, H. L. Florence, Graham C. Awdry, J. T. Christopher, F. T. Baggallay, J. J. Burnet, J. H. Christian, R. St. A. Roumieu and George Scamell.

Mr. Ibberson seconded, and the motion was agreed to.

Mr. Aston Webb, A.R.A., having been elected a trustee,

Mr. H. L. Florence proposed, and Mr. Inskipp seconded, a vote of thanks to the hon. treasurer, Mr. W. Hilton Nash, and the hon. secretary, Mr. Percivall Currey, for their services, and also that they be re-elected for the ensuing year.

The motion having been agreed to,

Mr. Christopher moved:

"1. That By-law No. 55 shall be amended to read as follows: 'All legacies and all donations shall (unless otherwise directed by the donors) be laid out or invested under the direction of the Council, in or upon Government or other securities or investments in which a trustee may invest under the powers of the Trustee Act, 1893, or under any subsequent Act or Acts for the amendment of the same, or in or upon any security or investment for the time being permitted by the Chancery Division of the High Court of Justice, or any authority constituted in lieu thereof.'

2. That the first word in By-law No. 65 shall be altered from 'Six' to 'Ten.'"

Mr. Zeph. King seconded, and the resolutions were agreed to.

It was also agreed:

"3. That in By-law No. 41 the word 'week' shall be substituted for 'Wednesday.'"

A vote of thanks to the retiring auditors, Messrs. J. T. Christopher and Henry Hall, having been agreed to, Messrs. E. Buckle and G. Hubbard were elected auditors for the ensuing year.

On the motion of Mr. G. Scamell, seconded by Mr. F. T. Baggallay, a vote of thanks was accorded to the Royal Institute of British Architects for the use of rooms, &c.

A vote of thanks to the Chairman brought the proceedings to a close.

A general meeting of the Society will be held on Monday, March 24, to confirm the alteration of the by-laws.

ARCHITECTURAL SOCIETIES.

BRISTOL SOCIETY OF ARCHITECTS.—On the 10th inst. a meeting of this Society was held, the President, Mr. Frank W. Wills, in the chair, when Mr. Howard Chalfeild Clarke read a paper on "Ancient Lights." A vote of thanks was proposed by Mr. Wood, seconded by Mr. W. L. Bernard, and supported by Mr. Harold Smith. We hope to be able to print the paper in our next issue.

ARCHITECTURAL ASSOCIATION OF IRELAND.—At a meeting of this Association, held on the 4th inst., Mr. R. M. Butler in the chair, Mr. Marmaduke Purcell delivered a lecture upon "Chemistry in its Relation to the Arts." The lecturer dealt generally upon the importance of a study of chemistry by children at school, for it tended to the encouragement of exactness, cleanliness, and thoughtfulness, but more particularly upon the effects which chemistry and its researches had had upon building, opening up as it had done new processes of manufacture and general improvement in the chemical composition of materials.—Mr. F. G. Hicks proposed a vote of thanks to the lecturer, which was seconded by Mr. F. Shaw, and supported by Messrs. H. Allberry and E. Bradbury, and agreed to. Mr. Purcell, in acknowledging the vote of thanks, gave replies and explanations to several questions raised by some of the members present.

EDINBURGH ARCHITECTURAL ASSOCIATION.—By permission of the Edinburgh and Leith Corporation Gas Commissioners, some fifty members of the Edinburgh Architectural Association had an opportunity, on Saturday last week, of inspecting the new gasworks at Granton. On arrival the party, after having a general view of the undertaking from the bridge at the south-east corner of the site, were conducted over the works by Mr. W. R. Herring, the Chief Engineer, who explained the leading features and purposes of the various buildings, the machinery and its uses, and generally the methods that will be adopted in gas production, &c., on the completion of the scheme.

THE STUDENT'S COLUMN.—Our Student's Column article ("Drainage," &c.) is held over until next week on account of the pressure of other matter.

THE PRICE OF NORTH LONDON GAS.

On the 7th instant a conference of representatives of the Corporation of London, the London County Council, and the Metropolitan Boroughs was held at the County Hall, Spring Gardens. The following resolutions were passed :—

"1. That in the opinion of this conference, the price charged by the Gas Light and Coke Company for gas supplied on the north side of the Thames is excessive, and constitutes a serious burden on the consumers of gas for domestic and manufacturing purposes.

2. That inasmuch as the management of the Gas Light and Coke Co. was condemned by the Select Committee of 1899, and the company have not complied with the recommendations of that Committee, and there is no immediate prospect, under existing conditions, of any substantial reduction in the price of gas, this conference considers that Parliament should be asked to forthwith intervene to protect the consumers from the present monopoly.

3. That inasmuch as three years have elapsed since the Select Committee of 1899 reported that the time had come when a reduction of the standard price might fairly be recommended, this conference earnestly requests the President of the Board of Trade to receive a deputation and to introduce a Bill into Parliament at the earliest possible moment to give effect to the recommendations of the Select Committee.

4. That in the event of the Government being unwilling to promote legislation for the redress of the consumers' grievance, this conference requests the London County Council and the Corporation of London to introduce a Bill into the next session of Parliament for the purpose of securing, either by revision of the present sliding scale arrangements or otherwise, a substantial reduction in the price of gas supplied by the Gas Light and Coke Co. north of the Thames.

5. That the advantages secured to the local authorities on the north side of the Thames by the City of London Gas Act of 1868 and the Amalgamation Scheme of 1883 as to the supply of gas for public purposes should not be interfered with."

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Clapham.—Twenty-seven houses with bay-windows on the south side of Deauville-road, Elms-road, Clapham, westward of Rodenhurst-road (Mr. W. E. Kerven).—Consent.

Dulwich.—A one-story shop on part of the forecourt of No. 68, Church-street, Camberwell (Messrs. F. Ward & Sons for Mrs. Clarke).—Consent.

Hackney, North.—A show case on the forecourt of No. 128, Albion-road, Stoke Newington (Messrs. A. F. Small & Co. for Mr. A. Joscelyn).—Refused.

Lewisham.†—A one-story addition at the flank of No. 1, Longton-grove, Sydenham, to abut upon Jew's-walk (Mr. J. H. Smith for Mr. G. Lister).—Refused.

Strand.—An iron and glass shelter at the entrance to the buffet and grill-rooms of the Grand Hotel, Charing Cross, to overhang the footway of the Strand (Mr. W. Woodward for the Gordon Hotels, Ltd.).—Refused.

Wandsworth (Detached).†— Additions in front of a factory building on the east side of Norwood-road, Herne-hill, southward of Croxted-road (Mr. C. M. Quilter for the Fisher Bookbinding Co., Ltd.).—Refused.

Woolwich.—A projecting lamp in front of the Director-General public-house, No. 27, Wellington-street, Woolwich (Mr. B. W. Adkin for Messrs. T. Norfolk & Sons and Mrs. A. M. Harper).—Refused.

Width of Way.

Kensington, North.—Rebuilding of a chapel on the western side of Bosworth-road, Kensington, with the external walls of the new building at less than the prescribed distance from the centre of the roadway of Stockton-mews (Mr. J. W. Chapman for the trustees of the Bosworth mission chapel).—Consent.

Space at Rear.

Holborn.—A modification of the provisions of Section 41 of the Act, so far as relates to the proposed erection of a building on the site of Nos. 79 and 80, High Holborn, with an irregular open space at the rear (Mr. L. W. Ridge for Mr. Owen Owen).—Consent.

Formation of Streets.

Hampstead.—Variation from the sections sanctioned on December 18, 1900, in connexion with the formation of a new street, to be named Glenloch-street, to lead from Haverstock-hill to Glenilla-street, Hampstead (Mr. C. J. Bentley for Mr. J. C. Hill and himself).—Refused.

Paddington, North.—That an order be issued to Messrs. Boehmer & Gibbs, refusing to sanction the widening and adaptation for carriage traffic of a footway known as Clarendon-passage, Maida Vale, and in connexion therewith the removal of the wall and steps at the eastern end of Clarendon-street and an alteration in the levels of Clarendon-street and Lanark-place (for Messrs. G. H. & A. Bywaters).—Agreed.

Brixton.—That an order be issued to Mr. W. Hunt refusing to sanction the formation or laying out of new streets for carriage traffic out of the east side of Clapham-road and north side of Landor-road, Lambeth (for Mr. W. P. Goosey).—Agreed.

Lines of Frontage and Space at Rear.

St. George, Hanover-square.—The rebuilding of No. 55, St. James's-street, Piccadilly, abutting upon Bennett-street, and, in the erection of the new building, certain deviations from the plan certified by the district surveyor (Messrs. Newman & Newman for the American Dental Institute.)—Consent.

Hammersmith.—A block of residential flats on the north side of Blythe-road, Hammersmith, with an irregular open space at rear and to abut upon Wharton-road (Mr. G. H. Fox for Mr. T. Pockington).—Refused.

Width of Way, Line of Frontage, Space at Rear, and Height of Buildings.

Paddington, North.†—Buildings with projecting porches, bay-windows, and balconies, on the site of Nos. 5 to 35 (odd numbers only, inclusive), Maida-vale, to an advanced line of frontage in Maida-vale, with the external walls of the buildings at less than the prescribed distance from the centre of the roadway of Lanark-place (Messrs. Boehmer & Gibbs for Messrs. G. H. & A. Bywaters).—Refused.

Width of Way and Construction of Building.

Stepney.—A wood and iron chapel building of a temporary character on the northern side of Sion-square, Mile End Old Town (Mr. M. Raphall).—Refused.

Dwelling-houses on Low-lying Land

Deptford.—That the solicitor do prepare a licence under Section 122 of the Act to Mr. H. A. Vohmann for the erection of twenty-seven cottages on low-lying land at Whitcher-street, Deptford, in accordance with the plan submitted with the application of Mr. S. Scholfield on his behalf.—Agreed.

*** *The recommendations marked † are contrary to the views of the local authorities.*

LONDON BUILDING ACT, 1894.

TRIBUNAL OF APPEAL CASE DISMISSED.

The Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Westminster, on Tuesday, to hear an appeal by the Trustees of the Hearts of Oak Benefit Society against the certificate of the Superintending Architect of the London County Council, under Sections 22 and 29 of the Act, defining the general line of buildings on the north side of Euston-road, St. Pancras, between Church Way and Euston-square.

The members of the Tribunal sitting were Messrs. J. W. Penfold (chairman), A. A. Hudson, and E. A. Grüning.

The appellants were represented by Mr. MacMorran, K.C., and Mr. R. P. Mahaffy (instructed by Messrs. Capel Cure & Ball) and the respondent by Mr. Horace Avory and Mr. Daldy (instructed by Mr. Andrews from the Solicitor's Department of the London County Council).

The particulars of the appeal were stated to be as follows :—The Hearts of Oak Benefit Society are the owners in fee simple of the land on the north side of and adjoining the Euston-road upon which the houses numbered 152 to 170 (even numbers) inclusive are situate, and are also owners in fee simple of the adjoining land on the south side of, and adjoining, Grafton-place, upon which the houses Nos. 18 to 27 are situated. The land was acquired by the Society as a site to demolish and to clear in order to erect new offices. Accordingly application was made by Mr. M. C. Meaby, the Society's surveyor, to the London County Council for permission to erect the front main wall of their new offices on the same line as that on which the front main wall of the new Hospital for Women had been erected. To this the Council declined to consent, and Mr. Meaby thereupon applied to the Superintending Architect, under Section 22 of the London Building Act, 1894, to define the general line of buildings in that portion of Euston-road in which the Society's land was situated. On January 21 the Superintending Architect certified that the main fronts of the buildings as indicated in his plan formed the general line of buildings on the north side of Euston-road between Church Way and Euston-square. The appellants now submitted to the Tribunal that the general line of buildings so certified was in fact the existing frontage of the houses on the land acquired by the Society, and which would be pulled down and demolished by them. It was against this certificate of the Superintending Architect that the Society were now appealing.

The appellants pointed out that the distance of the front main wall of the buildings from the footway was greater than 50 ft. The width of the pavement opposite the building varied from 9 ft. 7 in. to 10 ft. 10 in., and the width of the roadway was about 38 ft. The front main wall of the hospital was about 24 ft. 6 in. from the footway in Euston-road. Moreover, to the east of the hospital and as far as the Midland Railway Co.'s goods sheds the front main walls of all the buildings on the north side of the Euston-road were flush with the footways. Opposite the land acquired by the Society is the Parish Church of St. Pancras, which, for the majority of its length, was about 77 ft. distant from the footway on the south side of the road. The grounds of the appeal were these :—That the Superintending Architect was wrong in not taking into consideration the general line of buildings in Euston-road to the east of the line which he certified when making his certificate, and that the general line of building on the north side of that portion of Euston-road in which the company's land was situated was not the line certified by the Superintending Architect.

Evidence was given by Mr. Meaby in support of the appeal, but the Tribunal came to the conclusion that the appellants had no case. Without calling on counsel for the respondent, they dismissed the appeal and allowed respondent forty guineas costs.

Correspondence.

QUANTITIES SUPPLIED *v.* QUANTITIES NOT SUPPLIED.

Sir,—Referring to the letter in your issue of the 1st inst., I think, from practical experience, Mr. Kinder got his client's houses built very cheap at 8d. per cubic foot, for in 1900 I had to prepare an estimate from the drawings and specification for a villa residence near London (I am assuming that the houses referred to on his estate are villas), also costing about 3,000*l.*, for one of the most respectable builders in London, valuing my own dimensions, *i.e.*, "builders' quantities;" and after the estimate was finished I cubed up the villa, as a check, and found it worked out at upwards of 9½*d.* per cubic foot—9½*d.* and some small allowance for carriage of materials, fifteen miles from London, and travelling expenses. We were the lowest, and within 1½ per cent. of the next competitor. I am quite sure my quantities were exact and valued at the lowest competition prices; and in the present unsettled state of the building trade I believe the work could not be done for less to leave a fair and reasonable profit.

All builders advocate for quantities to be supplied, and I can fully endorse all Mr. Kinder has said as to some quantities supplied, especially by country architects, being useless to tender upon, and increasing the cost of a building; as an instance, the roof being billed at per square "including slating, felt, boarding, fir, and the necessary straps and bolts"; the stone front at per foot superficial, "and form your own allowance for projection of mouldings, bonders, and depth on beds"; forgetting that the only way to measure stonework, to be of any use in estimating, is as the stone "goes to the banker," and bill the number of ft. cube; painting to doors per yard superficial measured over the architrave, no dimensions being given of the girth of the architrave, or the panel mouldings of the doors. He certainly stated "four coats," but these doors had to be painted four times, flatted, and the mouldings cut in a different tint; the architrave should have been billed at per lineal foot stating the girth, or at least as small surfaces, and the panel mouldings also at per lineal foot.

WILLIAM H. PIPE.

Extension of Aberdeen Public Library.—A meeting of the Buildings Sub-committee of the Public Library Committee was held in the Public Library, Aberdeen, on the 7th inst. Plans were submitted in reference to the proposed new central reading-room, and the architects (Messrs. Brown & Watt) were instructed to amend the plans somewhat. With regard to the Torry branch reading-room, Messrs. Brown & Watt were selected to prepare sketch plans of a building on the site recently purchased at the corner of Victoria-road and Grampian-road.

BOOKS RECEIVED.

THE ABBEY OF ST. MARY, IN FURNESS, LANCASHIRE. By W. H. St. John Hope, M.A. (T. Wilson, Kendal.)

THE CATHEDRAL CHURCH OF AMIENS. By the Rev. Thomas Perkins. (Geo. Bell & Sons.)

THE ABBEY AND CHURCH OF WESTMINSTER. By Charles Hiatt. (Geo. Bell & Sons.)

CHICHESTER: THE CATHEDRAL AND SEE. By Hubert C. Corlette. (Geo. Bell & Sons.)

THE MUNICIPAL YEAR-BOOK OF THE UNITED KINGDOM. 1902. Edited by Robert Donald. (Edward Lloyd.)

ENGINEERING CHEMISTRY. By H. Joshua Phillips, F.I.C., F.C.S., A Inst.C E. Third Edition. (Crosby Lockwood & Co.)

THE MODERN TREATMENT OF SEWAGE. By H. C. H. Shenton, M.S.E. (S. Edgecumbe-Rogers.)

OBITUARY.

MR. BRYAN DONKIN, C.E.—Early on the morning of March 4, Mr. Bryan Donkin died very suddenly in Brussels from heart disease, at the age of sixty-six. The name he bore has been intimately associated with the advancement of mechanical science for a century or more, although not so well known to the general public as those of other pioneers in the same field. The works in Bermondsey with which Mr. Donkin was associated for more than forty years, were originally established by his grandfather in the year 1803, being then chiefly devoted to the production of paper-making machinery, and since to various useful types of engineering plant. Mr. Donkin was educated at University College, London, and at the Ecole Centrale des Arts et Métiers, Paris, afterwards serving an apprenticeship at the Bermondsey works, which he joined as a partner in the year 1868. In 1873 he was elected a member of the Institution of Mechanical Engineers, and at the time of his death was a Vice-President of that body. In 1884 he was elected a Member of the Institution of Civil Engineers, by whom he was awarded the Watt Medal, the Telford Premium, and the Manby Premium. He was also a Member of the American Society of Mechanical Engineers, of the Société d'Encouragement, Paris, and of the Verein Deutsche Ingenieure, Berlin. Although engaged for many years in the active conduct of affairs at the works of his firm, the natural inclination of Mr. Donkin was clearly towards the field of scientific research, and when occupied in the manufacture of steam engines, he conducted various investigations which have been of the utmost value to the nation, a fact little known by the people who have been the most benefited. For some years past Mr. Donkin had more opportunity of devoting himself to experimental and literary work. The numerous papers contributed to the Institutions of Civil and Mechanical Engineers testify to years of patient research, and some of his most noted investigations were those undertaken in conjunction with Professor Kennedy, and relating to the efficiency of steam boilers. Mr. Donkin's works on "Heat Efficiency of Steam Boilers" and "Gas, Oil, and Air Engines," bespeak an immense amount of hard work, and are recognised as most valuable text books on those subjects. Mr. Bryan Donkin was a familiar figure at the meetings of the two leading Engineering Institutions in London, and his loss will be regretted by a large circle of professional as well as other friends.

GENERAL BUILDING NEWS.

PRESBYTERIAN BUILDINGS, GATESHEAD.—The foundation-stone of a hall and classrooms in Brighton-avenue, Gateshead, for the Presbyterian cause has just been laid. The scheme comprises a church to seat about 700, with hall to seat 500, classroom accommodation and caretaker's house. Messrs. Badenoch & Bruce, Newcastle, are the architects for the work, and the contractor for the hall and classrooms is Mr. John Anderson, Newcastle. The church will stand at the corner of Brighton-avenue and Whitehall-road, and the hall is placed behind to the north, fronting on Whitehall-road and Ridley-street. The walls will be in stone, with hammer-dressed facing and chiselled dressings. The total cost of the completed scheme, including site, is estimated at 8,000*l.* The present contract, which includes hall, caretaker's house and classrooms, will cost about 2,800*l.* exclusive of site.

CHURCH, MILNGAVIE, STIRLINGSHIRE.—The memorial stone of Cairns New U.F. Church, Milngavie, has just been laid. The new church is designed by Colonel J. B. Wilson, Glasgow, and will accommodate 650 members. The contractors are Messrs. J. H. White & Sons, Glasgow; joiners, Messrs. Wm. Guthrie & Co., Glasgow; slaters, Messrs. Hamilton & Co., Glasgow; plasterer, Mr. George Borland, Milngavie; plumber, Mr. Renfrew, Glasgow; mason for manse, Mr. Currie; and joiners for manse, Messrs. A. & D. M'Millan, Milngavie.

STEVENSON MEMORIAL CHURCH, GLASGOW.—The new Stevenson Memorial U.F. Church, Glasgow, has just been opened. It is situated on the boundary between Kelvinside and Maryhill districts, at Belmont Bridge, Belmont-street, running off Great Western-road, just past Kelvin Bridge. The architect is Mr. John J. Stevenson, London, whose design was illustrated and described in the *Builder* for May 28, 1898.

METHODIST FREE CHURCH, EASTVILLE, BRISTOL.—A new Methodist chapel has been erected at Eastville, opposite the first entrance to the Park. The church is designed to seat 800 persons, and, with extensions to the school at the back, the total cost is estimated at 4,000*l.* The building is of Gothic style, and has a gallery running round three sides. The accommodation for the choir is behind the rostrum. The seats and internal roofing are of pitch-pine. Mr. E. Clarke, builder, of Fishponds, has carried out the contract in accordance with the plans of Mr. H. M. Bennett.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Town Council has sanctioned the following plans of new buildings:—Shed on the south-east side of Baltic-street, for Messrs. D. Macdonald & Sons, commission merchants, per Mr. R. G. Wilson, architect. Shed on the south side of Whitehall-place, for Mr. Edgar Gauld, builder, per Mr. W. E. Gauld, architect. Shed and polishing mill on the west side of the road leading from Merkland-road East southwards to the Corporation gasholder, for Messrs. Gibb Brothers, granite merchants, per Mr. William Smith, architect. Alterations in connexion with premises, Nos. 61 and 63, St. Nicholas-street, for Messrs. Alexander Badenoch & Son, clothiers, per Mr. W. E. Gauld, architect. Alterations in connexion with premises, Nos. 171-173, Union-street, for Messrs. Edmonds & Ledingham, advocates, per Mr. R. G. Wilson, architect. Dwelling-house on the north-west side of Braemar-place, for Mr. James Farquhar, builder, per Messrs. Brown & Watt, architects. Alterations in connexion with premises, Nos. 7 and 9, Justice-street, for Messrs. Cochran & Macpherson, advocates, per Mr. R. G. Wilson, architect. Dwelling-house on the north side of Rubislaw Den North, for Mr. Thomas Ogilvie, jun., warehouseman, per Messrs. W. & J. Smith & Kelly, architects. Dwelling-house on the north side of Victoria-road, for Messrs. George & James Knowles, fishermen, per Messrs. Cameron & Watt, architects. Alterations at 3, Sinclair-road, for Mr. John Henderson, King-street, per Mr. Duncan Hodge, architect. Addition to fish-curing premises at North Esplanade for the Scottish Co-operative Wholesale Society, Ltd., per Mr. J. Davidson, architect, Glasgow. Alterations and additions in connexion with the fish-curing premises at Old Ford-road, for Messrs. Moir, Wilson, & Co., per Messrs. Brown & Watt.

THE BRADFORD BATHS SCHEME.—A special meeting of the Baths and Team Labour Committee of the Bradford Corporation was held on the 3rd inst. to consider the plans and specifications for the proposed central baths in Morley-street and the district bath in Drummond-road. Mr. A. Hessell Tiltman, of London, the architect, was present. A memorial was received by the Committee, signed by a number of persons who use Turkish baths at the Thornton-road establishment, complaining of the inadequate accommodation provided for such baths at that place. The city Architect (Mr. F. E. P. Edwards) reported, as he had been requested to do, upon the condition of the Thornton-road baths, and stated that the repairs required at the existing central baths cannot be executed at a less cost than 2,000*l.* or 3,000*l.*

BRITANNIA NAVAL COLLEGE, DARTMOUTH.—The foundation-stone of this building was laid last week by his Majesty the King. The architect of the building, which was illustrated and described in our issue for April 29, 1899, is Mr. Aston Webb, A.R.A. A view of the sick quarters and a brief description appeared in our issue for May 4, 1901.

INFIRMARY, WIGAN.—The new isolation wards recently added to the Royal Albert Edward Infirmary, Wigan, were opened recently. The new building forms a small separate hospital situated on the slope of the hill to the north-west of the old "Woods'" ward, and accessible from the grounds by a broad drive, terraced up to the entrance door on the west side. The entrance hall gives access to the two ante-rooms which open into the male and female wards on either side. Each of these is 24 ft. by 22 ft., with a circular ceiling, forming a lofty room, well lighted on each wall, and providing space for four beds. The duty-room for the nurses is placed between the two wards with a window looking into each, and doors into the separate ante-rooms. At the other end of the wards the sanitary accommodation (baths, lavatories, &c.) is arranged, the rooms being entered from a short corridor stretching across the building with a window at each end, separating them from the wards and preventing the risk of infection. From the entrance hall on the opposite side to the ante-room access is obtained to the ward kitchen and stores, passing the foot of the staircase to the upper floor, which extends above the hall and nurses' room, and contains bedrooms for the nurses and servants, with bath, lavatory, &c. In the basement story, which is reached from an outside entrance on the lower drive below the terrace, are placed the boiler and heating apparatus, warming the building and supplying steam and hot water. The building is constructed of brick and stonework, harmonising in appearance with the older buildings, and having slated roofs, crowned with turrets in which are fixed the ventilating cowls from the wards. Internally, with the exception of the sanitary annexes, which are lined with glazed brickwork, the walls and ceilings are finished in cement, and with the woodwork enamelled ivory white. Messrs. Thomas Worthington & Son, Manchester, were the architects, and the work has been carried out by Mr. C. B. Holmes, of Wigan, under their supervision. Messrs. Newton, Chambers, & Co., Manchester, were the hot water engineers.

BANK, ABERDEEN.—A new harbour branch of Aberdeen Town and County Bank is to be erected on the site of the present branch and of the two adjoining houses at the foot of Marischal-street. The elevation to Marischal-street is 83 ft. in length, and to Regent Quay 26 ft., the site being wedge-shaped, as Shore-lane runs at an angle at the back of the premises. The ground floor will be occupied by the bank, having a public office of about 40 ft. by 21 ft., with agents' room and waiting-room, &c. A firm of shipowners will occupy a suite of offices on the first floor, while on the upper floor there will be another suite of offices. The elevations, which are Renaissance in style, and will be built of granite, consist of a rusticated base, on which stands a row of pilasters, extending two stories in height, with Ionic capitals, and being carried up to the entablature at the Regent Quay front, where will be the principal entrance to the bank. The Marischal-street front will be crowned by a balustrade, divided into sections by moulded panels. As Shore-lane is at the rear of the building, it will be lighted from three sides. Electric light will be installed. The architect is Mr. R. G. Wilson, and the contractors are:—Mason work, Mr. J. Morgan; carpenter, Mr. J. Henderson; slater, Mr. George Farquhar; plumber, Messrs. Thom & Strachan; plaster work, Messrs. James Bannochie & Sons; and painter work, Messrs. Gordon & Watt.

CO-OPERATIVE BUILDINGS, CHIRTON, NORTH SHIELDS.—The new branch premises of the North Shields Industrial Society, Ltd., just erected at Chirton village, were opened on the 1st inst. The premises, which are situated on the main thoroughfare from North Shields to Percy Main and the Newcastle turnpike, comprise a block of buildings, in which are several departments for provisions, bread and confectionery, drapery, boots and shoes, &c. A new steam bakery is a part of the new premises. The premises have been erected by Mr. Fishburn, contractor, from the designs of Messrs. Hope & Maxwell, architects, with Mr. Joseph Warwick as clerk of works. The machinery in the bakery was installed under the superintendence of Mr. Owen, M.I.M.E., representing the engineers, Messrs. Werner, Pfleiderer, & Perkins.

Y.W.C.A. BUILDINGS, HEREFORD.—The foundation stones of the new hall of the Young Women's Christian Association were laid at Hereford recently. The new structure, which will be of two stories, will be built by Mr. William Powell, Hereford, of Hampton Park bricks and terra-cotta dressings, in the Renaissance style, from plans prepared by Mr. W. W. Robinson, architect, Hereford. The assembly-room itself, which will be open to the roof, will measure 50 ft. by 22 ft., and will be heated by two Shoreland grates, though provision has been made for hot-water apparatus should at any time this be desired. It will have a wide entrance porch. On the ground floor there will also be a classroom and two ante-rooms, one at the entrance and the other at the platform end of the hall, through which latter there will be a separate entrance for speakers. On the first floor will be a room, 21 ft. by 14 ft.

CO-OPERATIVE PREMISES, SMALL HEATH, BIRMINGHAM.—New buildings in Coventry-road, Small Heath, have been erected for the Birmingham Co-operative Society. The building is three stories in height, and has cost, with fittings, some 12,000*l.* There are four shops, a showroom on the first floor, and an assembly-room on the top floor. The last-named it is proposed to utilise for entertainments to members of the society, lectures to disseminate the principles of co-operation, and to let out for other purposes. The room will seat 700 people. The whole establishment is lighted by electricity, generated on the premises. The architect is Mr. F. E. L. Harris, Manchester, and the contractor is Mr. T. Rowbotham, Birmingham.

LIBRARY AND POLICE STATION, CHAPELTOWN, LEEDS.—A new branch library and police station are to be erected at the corner of Chapeltown-road and Town-street, Chapeltown, at a cost of about 8,000*l.* The two buildings, though separated internally, will adjoin each other, and will have a frontage of 103 ft. to Chapeltown-road and 77 ft. to Town-street. The library building will include lending library and reading-room, with a gallery on the first floor; and a ladies' room will be provided. The police station will include superintendent's house and fire-brigade station. The buildings, which have been designed by Mr. William H. Thorp, of Leeds, will be of stone.

SANITARY AND ENGINEERING NEWS.

A NEW BRIDGE OVER THE TYNE.—The North-Eastern Railway Company have given the contract for the building of a new high-level bridge over the River Tyne at Newcastle to the Cleveland Bridge and Engineering Co., Ltd., of Darlington. In point of size and cost this will be the largest bridge contract which has been given in the United Kingdom since the completion of the Forth Bridge.

The estimate of the engineer (Mr. Charles A. Harrison) of the cost was 470,000*l.*, but the contract is for rather less than that sum. The contract comprises a railway of four lines of road, beginning at a junction with the Newcastle and Carlisle Railway west of Newcastle and terminating by a junction on the main line east of the new bridge on the Gateshead side, being a length of over half a mile of viaduct. Besides, there is included a connecting loop railway of two lines of road, beginning at a junction with the railway at the south end of the bridge and joining the main line again to the west of Gateshead Station, this second railway forming a viaduct about 800 ft. in length.

NEW SEWAGE WORKS, LINLITHGOW.—The Local Authority having decided to introduce a new system of drainage for the town, the contractors—Messrs. Blair & White, Glasgow—have commenced the construction of the sewage disposal works. These will be situated a short distance from the burgh, and will occupy an area of between three and four acres. The system selected is the bacteriological or septic tank process of filtration. The works are expected to cost about 10,000*l.*

FOREIGN.

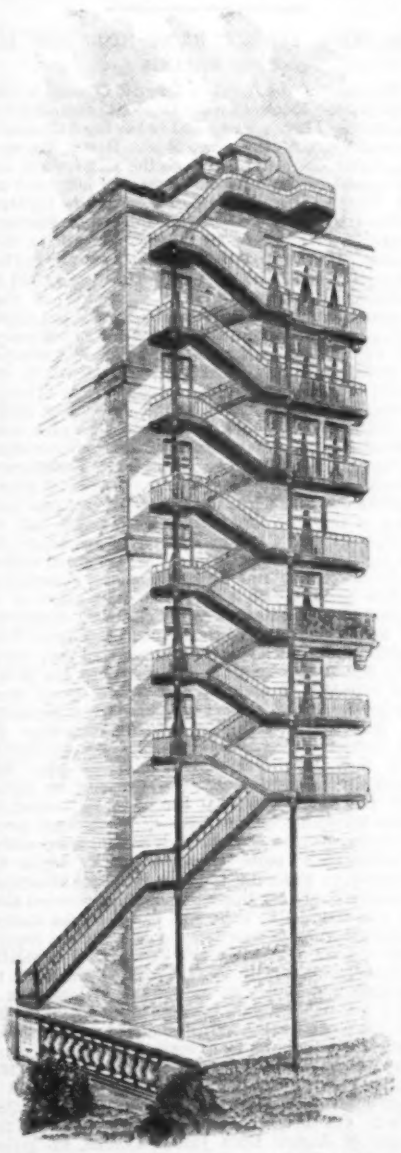
FRANCE.—M. Bouvard, the architect, has proposed a street improvement scheme for Paris which will obviate any necessity for the proposed bridge over the Seine adjoining the Pont Neuf and facilitate the traffic of the Rue de Rennes, which will be prolonged in the direction of the Rue du Louvre, with a bifurcation into two roads, one leading to the Pont des Saints-Peres and the other to the Pont Neuf. In this manner the Institut building will be opened up and will have a larger open space round it. New façades will be erected on the Rue de Seine (enlarged) and on the prolongation of the Rue de Rennes, but those on the Quay will remain as they are. It must be added that the Metropolitan Railway, which will pass under the river at this point, will materially reduce the traffic in the street and over the two bridges.——The municipality of Marseilles has voted the expenditure of a sum of 4,000,000 francs for the erection of thirty-nine new schools and the formation of a technical training school.——The differences between the State and the Société des Artistes Français have been at last smoothed over, and the Salon will open on May 1 as usual.——An exhibition of Industrial Art and Furniture is announced to be held in the Grand Palais this summer.——The jury of painting for the Salon remains the same as last year, all having been re-elected, M. Bouguereau at the head of the list with 1,010 votes.——M. de Morgan is arranging, at the Grand Palais des Arts, an exhibition of the antiquities discovered by him in Susa and Chaldæa.——The Conseil-Général of the Seine has opened a competition for the artistic decoration of the Mairie of Vanves.——Work has been commenced for the enlargement of the railway station at Amiens, one of the most important stations on the Nord railway line, but at present quite inadequate for the traffic.——At Toulouse a committee is to be formed analogous to that of "Vieux Paris" in the capital, in order to watch over the preservation of the antiquities of the town.——The French Government has voted a sum of over 20 million francs for the completion of a railway in the Soudan, as well as a sum of 100 millions for various public works in Algeria.——The death is announced, at Paris, of M. Albert Bitner, architect, and member of the Société Centrale, at the age of fifty-six.——M. Aizelin, the sculptor, has died at the age of eighty-one. He was a pupil of Ramey and of Dumont, and made his first appearance in the Salon of 1852, with a statue of Sappho. His principal works are the "Psyche" at the Luxembourg, the "Enfant au Sablier" in the Nantes Museum; and the "Orphée" in the Museum of Rheims. He executed a great number of busts, and took part in various public monuments in Paris and the Departments; among others the figure of "Japan" for the 1878 Exhibition; that of "Comedy" for the theatre of Monte Carlo; the statues of Bailly and Mme. de Sevigné for the Hôtel de Ville of Paris, and statues for the churches of St. Eustache and La Trinité.——We have to record also the death of M. Paul Flandrin, the painter, brother of Hippolyte Flandrin, at the advanced age of ninety-one. He was a pupil of Ingres, and after commencing as a historical painter, subsequently devoted himself to landscape. He executed, among other work, the mural decoration of the Château de Dampierre, and the paintings in the Church of St. Severin.

MISCELLANEOUS.

SHEFFIELD BUILDERS AND THE CITY COUNCIL.—The monthly meeting of the City Council of Sheffield was held on the 6th inst. Representatives were present from all the branches of the building trades. The strength of the Federation has now assumed such large proportions that the Council are now considering the desirability of nominating and supporting a candidate from the body for a seat on the City Council, in order that the building industry, which engages so much of the skilled labour belonging to the city, shall have its questions voiced by one of its own members. This question was taken up very heartily, and will soon be the most paramount question of the various societies forming the above Federation.—*Sheffield Telegraph.*

THE REMOVAL OF GLASGOW EXHIBITION BUILDINGS.—The Parks Committee of Glasgow Corporation, at a recent meeting, had before them a minute of a meeting of the Sub-Committee on Galleries and Museums. At that meeting the subcommittee on retention of the Glasgow International Exhibition Buildings and the restoration of the portion of the Kelvingrove Park used in connexion with the Exhibition, reported that they had a meeting on the 24th ult. with Mr. Hedley, manager of the Exhibition Association, and Mr. James Laird, auctioneer, when, having heard Mr. Hedley regarding the present position of the Exhibition contractors' accounts, they had remitted to Mr. Hedley and Mr. Laird to arrange for the Corporation, per the latter, now getting possession of the Exhibition buildings and grounds at once; and had authorised Mr. Laird's firm to commence at once the demolition of the grand avenue and bridge and Miss Cranston's tea-rooms, and thereafter proceed with the sale of the materials; and authorised Mr. Laird's firm to commence immediately on the expiry of three weeks from date the demolition of the whole of the other Exhibition buildings and the sale of the materials.

FIRE ESCAPE STAIRCASE, HYDE PARK COURT.—The illustration shows a fire-escape staircase erected by the St. Pancras Ironwork Company at the block of mansions known as Hyde Park Court. In 1900 the company erected two such staircases on



Fire Escape Staircase, Hyde Park Court.

the south side of the block, and in the autumn of last year they received an order for two more staircases on the north or park side of the building. These have been already finished, a month earlier than the contract time. Each staircase is in sixteen flights and over 100 ft. high.

METROPOLITAN IMPROVEMENTS, SOUTH LONDON.—The southern approach to the Tower Bridge, which was opened on Saturday last, was originally projected by the late Metropolitan Board of Works as a thoroughfare from the junction of the Old Kent and New Kent roads through Bermondsey to Tooley-street. After the completion of the Tower Bridge, the London County Council widened to 60 ft. Bermondsey New-road northwards, from the end of Old Kent-road to what was known as Star Corner, and Grange-road, whence they have constructed a new road, having the same width, to Abbey-street, at the corner of the churchyard—now a recreation ground—of St. Mary Magdalene parish church, and so across Tanner-street via Church-street and underneath the railway to St. John's Church at the corner of Artillery-street and Horseleydown. The thoroughfare is nearly three-quarters of a mile in length, and the cost of the works amounts to, it is stated, about 400,000*l.*—The Bermondsey Borough Council in taking over a scheme of the late Rotherhithe Vestry, resolved at their meeting on March 4, to offer premiums of 100*l.*, 60*l.*, and 40*l.* respectively, for the best three plans for the erection, at an estimated cost of 51,000*l.*, of working-class dwellings on the Fulford and Braddon streets area, situated between Paradise-street and the Pool at Rotherhithe. The Vestry's original plans, now relinquished, comprised four blocks of dwellings, to be rented at about 3*s.* 5*d.* per room per week.

THE CITY SURVEYOR, CHICHESTER.—Mr. James Saunders, A.R.I.B.A., has resigned the appointment of City Surveyor and Waterworks Engineer at Chichester, with the intention of entering on private practice as a civil engineer and architect at Newark and in Nottingham. The post of City Surveyor of Chichester therefore becomes vacant.

RUSSELL-STREET, DRURY-LANE.—A large block of buildings between Crown-court and the crossing of Drury-lane has lately been demolished, the clearance extending northwards as far as the south boundary of the children's playground, formerly a burial-ground appertaining to the parish of St. Martin-in-the-Fields and laid out in 1877 by the Metropolitan Public Gardens Association. At the corner of Russell-street and Drury-lane stood the old Albion tavern, which until recent years had formed a favourite resort of members of the dramatic profession in the days when the building of theatres had not advanced westwards to the locality near Leicester-square.

WIDENING OF PICCADILLY.—In the House of Commons on the 6th inst. Mr. Lough asked the First Commissioner of Works whether his attention had been called to a report recently made to the London County Council by its Improvements Committee, detailing the negotiations which had taken place between the Council and his Majesty's Commissioners of Woods and Forests, with a view to secure upon the expiration of the leases and at a fair valuation the strip of freehold land required for the setting back of the buildings on the northern side of Piccadilly, so as to widen to 80 ft. the portion of the thoroughfare between the Circus and Sackville-street; and whether he could see his way to assist the object in view. Mr. Akers-Douglas: I have seen the report referred to by the hon. member. No doubt the setting back of the buildings on this site would afford a great improvement to the traffic in this crowded thoroughfare; and I should like to see such an improvement carried out. The matter, however, is one which does not come under my department, and any question on this subject should be addressed to the Treasury.

PLUMBERS' EXAMINATION AT KING'S COLLEGE.—Thirty master and operative plumbers applying for registration under the National Registration of Plumbers attended at King's College on the 8th inst. for examination by the Worshipful Company of Plumbers. The candidates were from various parts of London, and also from Dover, Eastbourne, Hailsham (Sussex), Ramsgate, Redhill, St. Albans, St. Leonards-on-Sea, and Sutton (Surrey). The practical test included lead bossing and the making of plumbers' joints, &c. The examination questions included the subjects of contamination of drinking water from faulty connexions, roof covering, arrangement of bath, sink and closet wastes, drainage of town houses, and disconnection with sewers. The examiners were: Mr. Charles Hudson, master plumber, Chairman of the Board of Examiners; Mr. J. Knight, master plumber; and Messrs. J. T. Martin and G. W. Stacey, representing the United Operative Plumbers' Association of Great Britain and Ireland. Sixty per cent. of the masters and forty per cent. of the operatives succeeded in passing the examination.

INSTITUTE OF SANITARY ENGINEERS.—We draw attention to the fact (as stated in our advertising columns) that the dates of the examination in Practical Sanitary Science are altered from March 28 and 29, as originally advertised, to April 4 and 5.

INSTITUTE OF CERTIFIED CARPENTERS.—On Saturday afternoon, March 8, the members of the British Institute of Certified Carpenters visited the works of Messrs. F. W. Reynolds & Co., Edward-street, Blackfriars. Much interest was taken in the woodworking machinery, which was seen in operation, especially in the planing, moulding, tenoning, and mortising machinery, of which the firm have a large variety. At the close of the afternoon a vote of thanks to the firm for having kept their works open was moved by Mr. Ellis and seconded by the secretary, Mr. W. E. Cutter. Mr. F. W. Reynolds, in responding, said that it had been a pleasure to show the machinery to such an intelligent, critical, and appreciative gathering. He pointed out that if British manufacturing trades were to maintain their

supremacy, the British workman must do his best in the work in which he was engaged, and that he, as a manufacturer of woodworking machinery, was desirous of bringing out such machinery as would at all times be able to cope with the competition of foreign countries.

BEVERLEY MINSTER.—A very large clock with chimes has just been erected in the minster towers. The chimes play upon ten bells in the north-west tower, and the hours are struck upon a new bell (Great John), which weighs seven tons, in the south-west tower. The whole of the work has been carried out by Messrs. John Smith & Sons, of Derby, generally to the designs of Lord Grimthorpe.

WATER-COLOURS BY MR. ERNEST GEORGE.—Messrs. Frost & Reid have on view at their gallery at 8, Clare-street, Bristol, a small collection of water-colour drawings of architectural subjects by Mr. Ernest George, including subjects from Venice, Bologna, Dieppe, Louvain, and other Continental towns.

ABBEY DORE CHURCH.—A new stained-glass memorial window has recently been fixed in one of the large lancets in the clearstory on the south side of the presbytery at Abbey Dore Church. It is largely heraldic, and the centre is chiefly occupied by an elaborate shield of twenty quarterings—the arms of the donor—surmounted by helmet, crest, and mantlings. In the apex of the window are initials and monograms, and in the lower part a memorial inscription, the whole design being enclosed in a plain border. The window has been executed by Messrs. James Powell & Son, of Whitefriars, from the design and details supplied by the architect, Mr. Roland W. Paul.

LEGAL.

ACTION BY A BUILDER FOR RESCISSION OF CONTRACT.

THE case of Gibbs *v.* Towle came before Mr. Justice Farwell in the Chancery Division on the 5th and 6th insts.—an action by the plaintiff, a builder, the purchaser of a small property situated at Stapleford, in the county of Nottingham, against the defendant, the vendor, the plaintiff alleging that he was induced to enter into the contract by misrepresentations made by the defendant as to the area of the land in question.

The plaintiff asked for rescission of the contract, or in the alternative, if specific performance was granted, that there might, in consequence of the misrepresentation, be an abatement of the purchase price. No fraud was alleged.

Mr. Upjohn, K.C., and the Hon. Frank Russell appeared for the plaintiff; and Mr. C. E. Jenkins, K.C., and Mr. G. Lawrence for the defendant.

Mr. Upjohn, in opening the case, said that in March, 1901, Mr. Towle was endeavouring to sell a piece of land near Stapleford and advertised it. The plaintiff saw the advertisement, and the result was that the parties went together on March 18 to a place called Trowell. The plaintiff saw the land there, but entertained no idea of buying it. On walking back to Stapleford together a conversation took place about the land the defendant had there. On the same day the plaintiff saw the piece of land at Stapleford. The defendant represented that it was about 1,000 square yards and asked 30s. per square yard for it. He ultimately agreed to take the sum of 1,250*l.* for the land, that being at the rate of 25s. per square yard. An agreement was drawn up and executed on March 18, 1901, the agreement being to the effect that the defendant would accept 1,250*l.* for the land on the condition that the defendant should be allowed to pull down the old buildings on the site and keep the materials for himself. The purchase was to be completed by June 24 following. In April the defendant called upon the plaintiff at his place of business in Loughborough and asked him for a further instalment on the purchase price of the land. As a result of the interview the plaintiff agreed to give the defendant an additional 250*l.* on the purchase price agreed upon if the defendant would agree to give up his claim to the materials of the old houses on the site. It appeared that the plaintiff did not want to build quite as soon as he intended, and as the buildings were let and producing a rental he was anxious that that state of things should remain. In the following August the plaintiff's solicitor asked for an abstract of title, and on September 7 a complete abstract was sent. Then the question was raised as to the area of the land, and the plaintiff's solicitor instructed a surveyor to make a plan of the property. This was done, and the plan showed that the area of the land was only 690 sq. yds. That fact was communicated to the plaintiff, and then he raised the point that the land was not in accordance with the representation that the defendant originally made.

Evidence having been given in support of the plaintiff's case,

For the defence the defendant said he was formerly in the lace trade at Nottingham, but retired some time ago. He had since been engaged in building operations. On March 18 last year the plaintiff and his brother came to him about some land that he had for sale, and which he had advertised; but nothing came of this. When walking down the road he told the plaintiff and his brother about the land in question, and they visited it, he pointing out what he had conceded to the County Council for footpaths. He told them that the site originally included some 1,200 yards. He asked 1,500*l.* for the land. There was no mention of a price per yard, and he never said he must have 30s. per yard for it. Plaintiff said that 1,500*l.* was too much, and eventually plaintiff agreed to give 1,250*l.*, and he sold it for that price. It was not till the following October that he heard there was any dissatisfaction about the area of the land. The plaintiff asked as to the area of the land, but witness told him that he did not know how many yards there were in the area. He refused to make any abatement in the price when plaintiff told him about the area.

The defendant's wife having given evidence in support of the defendant's case, and Mr. Jenkins having addressed the court on behalf of the defendant, his Lordship, in giving judgment, said he did not impute intentional misrepresentation or want of bona fides against the defendant. He could not, however, accept the defendant's statement. His Lordship accordingly made a decree rescinding the contract, and ordered the defendant to repay to the plaintiff the deposits paid by the plaintiff, viz., 350*l.*, with a declaration that the plaintiff was entitled to a lien for the amount, together with profit, interest, and costs.

Mr. Upjohn said he was willing to accept a payment of 350*l.* without interest if paid within a month; if not paid within a month with 4 per cent. interest.

Judgment accordingly.

THE NEW STREET FROM HOLBORN TO THE STRAND.

THE case of the London County Council *v.* the Metropolitan Electric Supply Co., Ltd., came before the House of Lords, composed of the Lord Chancellor, and Lords Macnaghten, Shand, Davey, Brampton, Robertson, and Lindley, on the 10th instant, on the appeal of the plaintiffs from the judgment of the Court of Appeal, composed of Lords Justices Collins (now the Master of the Rolls) and Stirling, reversing an order of Mr. Justice Farwell in the Chancery Division. The case was reported in the *Builder* of May 4 and 18, 1901. The case raised a question of interpretation of a section of the London County Council (Improvement) Act, 1890. When the Act was passed the defendant company had a generating station and works for the purpose of electric lighting in Sardinia-street, the whole of which was required to be taken by the County Council for the purposes of the new street from Holborn to the Strand. A statutory bargain was arrived at between the parties, which was embodied in Section 58 of the Improvement Act. The dispute arose under Sub-section 7, which provided in effect that the Council, before the date of conveyance and lease of the new site (which the Council had to provide for the Company), should pay or secure to the satisfaction of the Company a sum equal to the costs of erecting and fitting up a new generating station upon the new site, with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts. The plaintiffs contended that this meant that they were only bound to provide a sum equal to the costs and expenses of erecting and fitting up a new generating station with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and that they were not bound to bear the expense of a new plant of a capacity to generate and supply electrical energy to an output of 5,000 kilowatts, or any number more than 4,000 kilowatts, on the ground that, under unusual circumstances, a more powerful plant might be required to generate and supply 4,000 kilowatts. The defendants, on the other hand, contended that the sum claimed by them was based on the station and plant being of a capacity to generate and supply such output as a matter of practical commercial working, and that it was impossible for them to generate and supply an output of not less than a fixed amount without having, in addition to the minimum plant capable of generating or supplying such an amount, temporarily spare or extra plant in case of a breakdown or repairs. Mr. Justice Farwell held that the plaintiffs were right in their contention, and granted a declaration to that effect. On the defendants' appeal, however, to the Court of Appeal Lord Justice Collins, in giving judgment, said it was obvious that, in order to ascertain what sum was to be paid by the County Council, it was necessary to have a decision by competent persons on questions of fact. It was substantially agreed that the matter must go to an arbitrator as to some part of the matters in dispute, and it had been thought desirable to anticipate the arbitration by taking the opinion of the Court as to the construction of a point of law arising upon the section in question. The short point of law which the Court had to decide was whether, as a matter of law, the arbitrator was to be debarred from allowing, and therefore calling upon, the plaintiffs to pay for anything more than for such engines which could fairly be graded up to 4,000 kilowatts. The conclusion he came to was that on the section in question the proper direction would be that the sum to be paid would be for such plant as would be required to generate for a reasonable period under all conditions such as might reasonably be anticipated as energy of not less than 4,000 kilowatts. It would be for experts to determine the number of engines and their capacity sufficient to generate the requisite supply imposed on the defendants. If the experts said that four such engines were not competent in an ordinary commercial sense to carry out the obligation imposed on the defendants of continually supplying an output of 4,000 kilowatts, then the County Council must find the money and pay for anything more that was required. Lord Justice Stirling concurred, and the appeal was accordingly allowed. Hence the present appeal of the plaintiffs.

Mr. Haldane, K.C., M. C. E. Jenkins, K.C., and Mr. Methold, appeared as counsel for the appellants (plaintiffs), and Mr. Cripps, K.C., and Mr. Sargant for the respondents (the defendants).

At the conclusion of the arguments of counsel, their Lordships unanimously held that on the construction of the Act the limit of 4,000 kilowatts was intended to be the measure of the County Council's liability.

The appeal was accordingly allowed, the judgment of the Court of Appeal being set aside, and the order of Mr. Justice Farwell restored.

ACTION FOR PROFESSIONAL FEES.

THE case of Dolby & Williamson *v.* Lord Wenlock came before Mr. Justice Wright, sitting without a jury, in the King's Bench Division on the 11th inst.

Mr. McCall, K.C., and Mr. B. A. Cohen appeared as counsel for the plaintiffs; and Mr. Lawson Walton, K.C., and Mr. Bairstow for the defendant.

In this case it appeared that the plaintiffs, who are electrical engineers, claimed from the defendant 318*l.* for professional fees in connexion with the installation of electric light at Lord Wenlock's seat, Escrick Park, York. The defendant had paid 150*l.* into court, with a denial of liability. The case turned on the correspondence between Mr. Walker, Lord Wenlock's agent, and the plaintiffs as to the amount for which the work in question was to be done. Mr. Lawson Walton submitted that the work was to be executed for 3,000*l.* The work occupied from October, 1900, to June, 1901; and Mr. McCall contended that on the letters between the parties, if there was a limit to 3,000*l.* it applied only to the year 1901, the instructions being that the plaintiffs were to prepare a scheme which would be capable of development and on which there would be much larger expenditure than 3,000*l.* in the year 1901. In the communications which passed various alternative tenders were submitted to the agent, who decided that the highest was too expensive and the lowest unworkable. Suggestions were made by which portions of the scheme should be omitted, and on this part of the case Mr. Walton put it that the letters showed that even with these reductions on a higher tender the work was not to cost more than 3,000*l.*

His Lordship pointed out that the plaintiffs had charged 3 per cent. on a scheme which was to cost about 5,000*l.*, as well as 3 per cent. on a smaller scheme. Could they charge 3 per cent. on both schemes?

Mr. McCall contended that the plaintiffs were within their rights in doing so, as they had received instructions to prepare both schemes. The expert evidence would show that this was the ordinary practice of the profession. The plaintiffs had written to Mr. Walker that he could not expect them to go to the trouble of preparing a scheme and inviting tenders without compensating them for their trouble. In a further letter the plaintiffs had pointed out that it was unreasonable to expect the same results for 3,000*l.* as could have been obtained from an original estimate amounting to almost twice that sum.

Mr. Walton suggested that an answer to an application by plaintiffs for a payment on account of fees should be read.

Mr. McCall read the reply of Mr. Walker, which was to the effect that he would not pay any fees because he considered that the plaintiffs' charges were exorbitant and that Lord Wenlock was entitled to damages because of the inferior work which had been done.

Mr. E. R. Dolby, one of the plaintiffs, gave evidence of interviews he had with Mr. Walker as to the installation, and stated that he was told the defendant did not want to spend more than 3,000*l.* in the first year, and subsequent work was left open for future consideration. Mr. Walker, in a letter dated March 27, 1901, had agreed to spend 3,260*l.* in the first year, and the tender submitted was for 3,040*l.* That was a workable scheme, the lower figure having been arrived at by reducing the size of the battery. The 3 per cent. was charged on the smaller scheme as well as on the original one because plaintiffs had to prepare fresh drawings and arrange the plant in a different manner. Mr. Walker never said there was a limit of 3,000*l.*, and plaintiffs were only to be paid for that. Plaintiffs prepared a scheme of which sections could have been carried out for 3,000*l.*, but Mr. Walker put in other sections, which raised the cost. The work which had been carried out by

others were according to the plans prepared by plaintiffs.

Mr. Walton said he did not dispute that the scheme which had been carried out was workable, but what he did suggest was that the plaintiffs had prepared a scheme which was not workable, and for which they charged their fees.

Mr. Dolby, continuing, said the charges of the plaintiffs were fair and reasonable, and according to the usual practice. In cross-examination he claimed that an electrical engineer was entitled to be paid scale fees, even if the scheme was not approved.

Mr. Birstal, electrical engineer, said the charges made by the plaintiffs were usual in the profession.

Cross-examined, the witness said, generally speaking, he agreed that the estimate should be carried out for within 20 per cent. of the figure quoted before the engineer could be considered as entitled to his fees.

Mr. Walton, for the defence, said that the defendant was anxious that the plaintiffs should be paid something, and he considered the sum paid into court ample payment for the services the plaintiffs had rendered. The limit of 3,000*l.* had been fixed upon, but plaintiffs had submitted a scheme costing far more than that sum, and the 150*l.* was paid into court in respect of such portion of their services as had proved useful to the defendant.

Mr. Francis Elliot Walker, the defendant's agent, gave evidence to the effect that from the beginning to the end the limit as to 3,000*l.* was insisted upon. A tender was obtained for 3,800*l.*, but witness refused it, and he put an end to the matter. The plaintiff's then sent in a mutilated scheme for 3,040*l.* Had he been aware that the plaintiffs' estimate might be exceeded by above 20 per cent. he would not have agreed to it. He was limited by Lord Wenlock to 3,000*l.*

Mr. E. A. Grüning, architect, said that in a case where the design sent in was more costly than the estimate the range allowable was within 10 per cent. of that estimate before the architect could claim his 3 per cent. That was the custom of his profession, though it was not the law.

His Lordship asked whether there was any objection to payment by *quantum meruit*?

Mr. McCall said he was quite ready to take six guineas a day.

Mr. Watney, electrical and consulting engineer, said if an estimate was made it should be carried out at a figure within about 10 per cent. of it.

Mr. Walton submitted that all the plans had been obviously experimental, and taking the seven days during which Mr. Dolby was occupied at six guineas a day, together with incidental work in London, that would give a sum of about 50*l.* Three times that amount had already been paid into court, and considering that, strictly speaking, Mr. Dolby was entitled to nothing, his estimate having been exceeded, he had been very justly dealt with.

His Lordship, in giving judgment, said it was pretty clear that there was no rule as to charging 3 per cent. on either the tender or anything else, nor was there any custom prevailing as to the margin that could reasonably exist as between the estimate of the electrical engineer and the tender by which he was able to get the work done. The questions were whether the plaintiffs were entitled to anything at all, or whether they were to be paid by *quantum meruit*. On the whole, he came to the conclusion that the sum paid into court was sufficient to meet the claim, but as it had been paid in with a denial of liability, judgment would be for the plaintiffs, with costs down to the time of such payment into court.

No order was made as to the costs in court.

MEETINGS.

FRIDAY, MARCH 14.

Architectural Association Discussion Section.—Mr. H. C. Lander on "Co-operative Homes." 7.30 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Professor R. Elsey Smith on "Sanitary Building Construction and Planning: Soil and Local Physical Conditions." 7 p.m.

Institution of Junior Engineers. (*Westminster Palace Hotel*).—Paper on "The Uses of Engineering Models," by Mr. Percival Marshall, Chairman. 8 p.m.

Institution of Civil Engineers.—(Students' meeting).—Mr. H. J. Deane, B.E., on "The Use of Long Steel Wires in Surveying." 8 p.m.

Sheffield Society of Architects and Surveyors.—Paper by Mr. T. G. Jackson, R.A.

SATURDAY, MARCH 15.

Institution of Junior Engineers.—Conversazione at the Westminster Palace Hotel. Reception at 7 p.m. by the President (Sir John Jackson, F.R.S.E.) and Lady Jackson, the Chairman and Mrs. Marshall.

Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "Some Electrical Developments." V. 3 p.m.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at the Sewage Works, Sutton, Surrey. 3 p.m.

Hartley College Engineering Society, Southampton.—Mr. S. W. Smith on "The Microstructure of Steel." 7 p.m.

MONDAY, MARCH 17.

Royal Institute of British Architects.—Mr. Sidney K. Greenslade on "The Planning of some Recent Library Buildings in the United States," with lantern illustrations. 8 p.m.

Society of Arts (*Cantor Lectures*).—Mr. J. D. Geddes, F.R.P.S. on "Photography Applied to Illustration and Printing."—III. 8 p.m.

Royal Philosophical Society of Glasgow (*Architectural Section*).—Mr. A. G. Wallis, C.E., on "Some Details of Modern Sanitary Practice." 8 p.m.

TUESDAY, MARCH 18.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. W. Spinks on "Ventilation, Warming, and Lighting." 7 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Electrical Traction on Railways," by Messrs. W. M. Mordey and Bernard M. Jenkin. On the conclusion of this discussion, the following Papers will be read: "The Greenwich Footway Tunnel," by Mr. W. C. Copperthwaite; "Subaqueous Tunnelling through the Thames Gravel—Baker-street and Waterloo Railway," by Mr. Arthur H. Haigh. 8 p.m.

WEDNESDAY, MARCH 19.

Society of Arts.—Mr. J. Clifton Robinson on "Electric Traction: London's Tubes, Trams, and Trains." 8 p.m.

Sanitary Institute.—Mr. H. Percy Boulnois on "The Collection and Disposal of Refuse in Large Towns." 8 p.m.

Sanitary Institute (*Lectures and Demonstrations for Sanitary Officers*).—(1) Inspection in the District of Islington and at the Borough Disinfecting Station. 2 p.m. (2) Mr. W. Spinks on "Calculations, Measurements, and Plans and Sections." 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Institution of Electrical Engineers (*Birmingham Local Section*).—Mr. R. P. Hulse on "Tests on the Nernst Lamp" (communicated by Mr. D. K. Morris). 7.30 p.m.

Institution of Civil Engineers.—Students' visit to the works of the Incandescent Electric Lamp Co., Ltd., Brook Green, Hammersmith. Assemble at the works, 2.15 p.m.

THURSDAY, MARCH 20.

Carpenters' Hall, London Wall (*Free Lectures on Matters connected with Building*).—Mr. J. A. Gotch, F.S.A., on "Early Renaissance Buildings in England." 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. W. Spinks on "Sanitary Appliances." 7 p.m.

Institution of Electrical Engineers.—Mr. James Swinburne and Mr. W. R. Cooper, M.A., on "Problems of Electric Railways." 8 p.m.

FRIDAY, MARCH 21.

Architectural Association.—Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough." 7.30 p.m.

Royal Institution.—Geheimrath Professor Otto N. Witt on "Recent Developments in Colouring Matter." 9 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. W. Spinks on "House Drainage." 7 p.m.

Institution of Mechanical Engineers.—Papers to be read, and discussed collectively:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall: "Fencing or Guarding Machinery used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-shafts, and Safety Devices in connection with Lift-doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson. 8 p.m.

Birmingham Architectural Association.—Mr. G. A. Cox on "The B.A.A. Excursion to Burford," illustrated by Mr. J. Ward.

Glasgow Architectural Craftsmen's Society.—Messrs. J. McLeod and A. W. R. Bell on "Prevention of Damp in Walls." 8 p.m.

SATURDAY, MARCH 22.

Sanitary Institute (*Demonstration for Sanitary Officers*).—Inspection at Beddington Sewage Farm. 3 p.m.

Edinburgh Architectural Association.—Visit to Glasgow under the auspices of the Glasgow Architectural Association.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments." VI. 3 p.m.

Dundee Institute of Architecture.—Visit to Lenchars Church and Earlshall.

Hartley College Engineering Society (*Southampton*).—Mr. D. R. Bennett on "The Construction of Roads and Streets." 7 p.m.

Architectural Association.—Fourth spring visit, to (1) the Roman Catholic Cathedral, Ashley-gardens, Victoria-street, Westminster, 2.30 p.m.; (2) New Police-station at Cannon-row (New Scotland Yard), 4 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 28.—By G. B. HILLIARD & SON (at Chelmsford).

Blackmore, Essex.—The Elm Farm, 30 a. 0 r. 24 p., c., y.r. 42*l.* £500
Ingatestone, Essex.—Mill-green, a copyhold house, y.r. 20*l.* 300
Fryerning, Essex.—A copyhold cottage and enclosure, 3 a. y.r. 9*l.* 10*s.* 150
Cottage, four tenements and two plots of land, c., y.r. 22*l.* 350

By E. & S. SMITH.

Kentish Town.—76, Weedington-rd., u.t. 51 yrs., g.r. 8*l.*, y.r. 40*l.* 275
Muswell Hill.—Tetherdown, Laurel Lodge, f., e.r. 63*l.* 920

By A. H. TURNER & CO.

Horsell, Surrey.—The Cottage, f., p. 1,000
Clapham.—244 and 246, Clapham-rd., u.t. 35 yrs., g.r. 22*l.* 10*s.*, p. 1,095

March 3.—By HARMAN BROS.

Fulham.—34, Estercombe-av., u.t. 94 yrs., g.r. 8*l.* 8*s.*, e.r. 55*l.* 680
Hackney.—9, The Broadway (S), u.t. 43½ yrs., g.r. 6*l.* 10*s.*, e.r. 75*l.* (including fixtures) 615

By BELLAMY & CO. (at Walham Green).

Fulham.—60 and 62, Epirus-rd., u.t. 77½ yrs., g.r. 11*l.*, w.r. 8*l.* 4*s.* 670

March 4.—By DEBENHAM, TEWSON, & CO.

Mayfair.—2, Hill-st., u.t. 44½ yrs., g.r. 150*l.*, p... 5,000

By BOWDITCH & GRANT.

Croydon.—Chatsworth-rd., Roselea, f., p. 1,730

By EASTMAN BROS.

Sydenham.—1, Venner-rd., u.t. 76½ yrs., g.r. 9*l.*, q.r. 40*l.* £280

By FOSTER & CRANFIELD (on premises).

Hackney.—15, Dinmont-st., with yard, stabling, &c., u.t. 13½ yrs., g.r. 7*l.* 15*s.*, p. 1,025

March 5.—By PERCY H. CLARKE.

Streatham.—Babington-rd., Frating, f., e.r. 85*l.* ... 1,250
Kentish Town.—44, Castle-rd., u.t. 33 yrs., g.r. 5*l.*, q.r. 3*l.* 330
53 and 55, Lewis-st., u.t. 56 yrs., g.r. 10*l.*, y.r. 54*l.* 550
9 and 11, Quadrant-gr., u.t. 56 yrs., g.r. 10*l.* 10*s.*, y.r. 51*l.* 480
35, Hadley-st., u.t. 56 yrs., g.r. 3*l.*, q.r. 18*l.* ... 275
Brixton.—40 and 42, Tindal-st., u.t. 51½ yrs., g.r. 8*l.*, y.r. 67*l.* 12*s.* 460
Herne Hill.—46, Milkwood-rd. (S), u.t. 64 yrs., g.r. 7*l.*, y.r. 40*l.* 395
Southwark.—242 Tabard-st. (coffee shop), u.t. 34½ yrs., g.r. 7*l.*, y.r. 34*l.* 290

By FOSTER & CRANFIELD.

Camberwell.—Elmington-ter., f.g. rents 56*l.* 14*s.*, reversion in 78 yrs. 1,430
Forest Hill.—62, St. Germain's-rd., f., y.r. 30*l.* .. 580
Broadstairs, Kent.—2, Belmont-rd., f., y.r. 25*l.* .. 370
8, High-st. (S), f., y.r. 31*l.* 792
Canning Town.—Victoria Dock-rd., f.g. rents 38*l.* 10*s.*, reversion in 257 yrs. 950
Bethnal Green.—355, Cambridge-rd. (S), u.t. 183 yrs., g.r. 8*l.*, y.r. 40*l.* 630

By FRANK JOLLY & CO.

Clapton.—21 and 23, Pembury-rd., u.t. 45½ yrs., g.r. 18*l.*, y.r. 110*l.* 1,305
Forest Gate.—33, 55, and 57, Wellington-rd., f., w.r. 67*l.* 12*s.* 725

By HENRY MORTEN.

Highbury.—25, Poet's-rd., u.t. 47½ yrs., g.r. 5*l.* 18*s.*, e.r. 42*l.* 435

By A. PREVOST & SON.

Limehouse.—2, Rich-st., f., w.r. 31*l.* 4*s.* 460
Poplar.—26, 27, 28 and 29, Sussex-st., u.t. 51 yrs., g.r. 12*l.*, w.r. 130*l.* 900
23 to 33 (odd), Northumberland-st., u.t. 63½ yrs., g.r. 15*l.*, w.r. 190*l.* 16*s.* 1,130
Mile End.—85, 87 and 89, Carlton-rd., u.t. 27 yrs., g.r. 8*l.*, q.r. 8*l.* 820

By DOUGLAS YOUNG & CO.

Stockwell.—3, 5, and 7, Stockwell Pk.-cres., u.t. 24 yrs., g.r. 27*l.*, y.r. 129*l.* 785
Kennington.—57, Kennington Oval, y.r. 30*l.*; also l.g. rents 25*l.* 10*s.*, u.t. 17½ yrs., g.r. 20*l.* 425
Battersea.—39, Bridge-rd. West, u.t. 40 yrs., g.r. 11*l.*, y.r. 40*l.* 300
Streatham.—158 to 180 (even), Wellfield-rd., u.t. 57¾ yrs., g.r. 60*l.*, w.r. 430*l.* 16*s.* 2,720

By WYATT & SON (at Chichester).

Chichester.—23, Lennox-pl., f., w.r. 9*l.* 2*s.* 100
47, York-rd., f., w.r. 14*l.* 6*s.* 195

March 6.—By EDWARD J. CARTER.

Tunbridge Wells, Kent.—The Broadway, f.g.r. 25*l.*, reversion in 67½ yrs. 840
Mount Pleasant, f.g.r.'s 1,623*l.*, reversion in 72 yrs. 5,530
Calverley Pk., f.g.r. 50*l.*, reversion in 67½ yrs... 1,660

By GLASIER & SONS.

Hyde Park.—83, Westbourne-ter. and 93, Eastbourne-mews, u.t. 35½ yrs., g.r. 50*l.*, p. 2,725
Kensington.—21, Campden House-rd., u.t. 70 yrs., g.r. 50*l.*, p. 1,700

By NORMAN & SON.

Whitechapel.—High-st., Site-yd., comprising workshops, warehouses, stables, &c., u.t. 46½ yrs., g.r. 450*l.*, y.r. 550*l.* 1,500

March 6.—By NEWBON, EDWARDS, & SHEPHARD.

Islington.—Upper-st. (Hare and Hounds Yard), c.g.r. 35*l.*, reversion in 25 yrs. 760
8, Church-st., f., y.r. 42*l.* 10*s.* 875
255, Upper-st. (S), and 5, Swan-yard, f., y.r. 285*l.* 5,675
41 and 43, Northampton-st., u.t. 16½ yrs., g.r. 10*l.*, w.r. 97*l.* 10*s.* 330
Fulham.—18 and 22, Star-rd., with stabling, f., y.r. 140*l.* 1,630
Anerley.—171, Croydon-rd., u.t. 62 yrs., g.r. 15*l.*, e.r. 60*l.* 300
Holloway.—Charles-st., Victoria Cottage, u.t. 32 yrs., g.r. 8*l.*, y.r. 50*l.* 360
Forest Hill.—10, Waldenshaw-rd., u.t. 79 yrs., g.r. 11*l.*, e.r. 55*l.* 235
Kingston-on-Thames, Surrey.—19, Birkenhead-av., u.t. 82 yrs., g.r. 10*l.* 10*s.*, y.r. 40*l.* 255

By REYNOLDS & EASON.

Barnes.—57 to 75 (odd), Railway-st., and 11, Cross-street, f., w.r., 189*l.* 14*s.* 2,310
Whitechapel.—167, Whitechapel-rd., u.t. 38½ yrs., g.r. 32*l.*, p. 710
City of London.—14, Cheapside (s.), beneficial lease for 6½ yrs., y.r. 375*l.* 860

By WM. STEVENS.

Hackney, 11, St. Mark's-villas, u.t. 64 yrs., g.r. 6*l.*, e.r. 42*l.* 450

By STIMSON & SONS.

Bermondsey.—102, Drummond-rd., u.t. 42 yrs., g.r. 4*l.*, y.r. 45*l.* 420
Camberwell.—9, 10, 11, and 12, Station-ter., u.t. 53 yrs., g.r. 4*l.*, y.r. 231*l.* 1,500
Dulwich.—31, Underhill-rd., u.t. 66 yrs., g.r. 10*l.*, y.r. 40*l.* 270
Battersea.—77 and 78, Eccles-rd., u.t. 78½ yrs., g.r. 13*l.*, y.r. 66*l.* 595
Wandsworth.—140, 142, and 144, Bennerley-rd., u.t. 79½ yrs., g.r. 19*l.* 10*s.*, y.r. 96*l.* 895

March 7.—By G. ERNEST CLARKE.

Walthamstow.—10, 12, and 14, Clarendon-rd., f., w.r. 69*l.* 16*s.* 1,030
41, Prospect-hill, u.t. 61½ yrs., g.r. 14*l.* 17*s.* 6*d.*, p. 600
Leyton.—66, 68, and 70, Sophia-rd., u.t. 80½ yrs., g.r. 7*l.* 10*s.*, w.r. 66*l.* 6*s.* 365

By VINCENT S. LEIGH.

Hackney.—23 and 24, Church-st., u.t. 40½ yrs., g.r. 14*l.*, y.r. 84*l.* 735
Tottenham.—378, West Green-rd., u.t. 19½ yrs., g.r. 4*l.*, w.r. 31*l.* 4*s.* 100

By LINNETT & LANE.

Willesden.—10, The Ravenscroft, u.t. 79 yrs., g.r. 3*l.* 9*s.* 8*d.*, e.r. 32*l.* 295

[See also page 277.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.*, and 50*l.*	Mar. 29
*Accident Hospital	Mexborough Montagu Hospital	25*l.*, 10*l.*	May 1
*Public Free Library Buildings	Ilkeston Town Council	50*l.*, 25*l.*, and 12*l.* 10*s.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Water Supply Works, Selston	Basford R.D.C.	S. Maylan, Surveyor, Public Offices, Basford	Mar. 17
Schools, Hazlehurst	Walmersley & Ramsbtm. U.D.S.B.	T. Bell, Architect, 14, Grimshawe-street, Burnley	Mar. 18
Water Supply Works, Antrim	County Asylum Committee	J. Barton, Engineer, Exchange Buildings, Dundalk	do.
Footpaths, &c.	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
*Making-up Roads	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
Road Materials	Uckfield R.D.C.	—. Miles, 173, High-street, Lewes	Mar. 19
Hall, Barry, Wales	.....	G. Thomas, Architect, Queen-street, Cardiff	do.
Additions to Stores, Brownroyd	Bradford Co-operative Soc., Ltd.	Rycroft & Firth, Architects, Bank Buildings, Bradford	do.
Villa, Sheffield-road, Barnsley	.....	Crawshaw & Co., Architects, 13, Regent-street, Barnsley	do.
*Portland Cement	Borough of Cheltenham	Borough Surveyor, Municipal Offices, Cheltenham	Mar. 20
*Carting away Slop and Sweepings from Streets	Metro. Borough St. Marylebone	J. Paget Waddington, Town Hall, Marylebone-lane, W.	do.
Sewerage Works, Ardingley	Cuckfield (Sussex) R.D.C.	—. Beach, Surveyor, Munster Green, Haywards Heath	do.
Additions to Business Premises	Batley Co.-operative Soc., Ltd	H. B. Buckley, Architect, 85, Commercial-street, Batley	do.
Granite Road Metal, &c. (5,000 tons) near Leeds	Rothwell U.D.C.	J. T. Pears, Surveyor, Council Offices, Rothwell	do.
Houses, Undercliffe, Bradford	.....	Kmpsall & Clarkson, Architects, Exchange, Bradford	do.
Three Cottages, Broughton Moor, Cumberland	Mr. T. Irving	B. Elbeck, Dearham, Maryport	do.
Business Premises, South-street, Chichester	.....	Messrs. Shippam, South-street, Chichester	do.
Coach-house, &c., Alnwick Castle	.....	T. Pickard, Estates Office, Alnwick Castle	do.
Additions to Stores, Moulsham-street	Chelmsford Star Co-op., Society	C. & W. H. Pertwee, Architect, Bank Chambers, Chelmsford	Mar. 21
Paving Works, &c.	Durham Corporation	City Surveyor, Town Hall, Durham	Mar. 22
Bridge Works, Belmullet	Mayo County Council	J. Clarke, Court House, Castlebar	Mar. 24
Cottages, Slades Green, near Erith	Dartford R.D.C.	Tait & Hobbs, Architects, Dartford	do.
*Painting, &c., Schools at Southall	St. Marylebone Guardians	Superintendent, St. Marylebone Schools, Southall	do.
*Painting, &c., Infirmary, Rackham St., Notting Hill	do.	Steward of Infirmary	do.
Church Works	.....	Watt & Tulloch, Architects, Belfast	do.
Lavatories, &c., Old Town Hall	Barrow-in-Furness Corporation	Borough Engineer, Town Hall, Barrow	do.
Road Works, Selwyn-street, near Mansfield	Blackwell R.D.C.	H. Silcock, Surveyor, 348, Westgate, Mansfield	Mar. 25
Granite Road Metal, &c.	Ely (Cambs) R.D.C.	—. Ronals, Surveyor, Egremont-street, Ely	do.
*Ottawa and Baffin Buildings, Prestons-road, Poplar	London County Council	Architect's Department, Housing Branch, 13, Pall Mall East, S.W.	do.
*Kerbing, Channelling, and Tar Paving	Bromley U.D.C.	Council's Surveyor, Bromley, Kent	do.
*Works and Materials	do.	Council's Offices, Bromley, Kent	do.
*Erecting Electric Generating Station	Maidenhead Town Council	Council Surveyor, Guildhall, Maidenhead	Mar. 26
Road Materials, &c.	Strood (Kent) R.D.C.	G. W. Prall, Workhouse, Strood	do.
Chapel and School, Bridgwater	.....	R. M. Challice, Architect, 14, Bedford-circus, Exeter	do.
*New Bridge, Sutton Ford, near Rochford	Essex County Council	County Offices, Duke-street, Chelmsford	Mar. 27
Road Materials, &c., New Malden	Malden and Coombe U.D.C.	T. V. H. Davison, Cambridge-road, New Malden	Mar. 31
*Percy House Schools, Isleworth	Brentford Union	W. H. Ward, Paradise-street, Birmingham	April 1
*Public Library, Plaistow	West Ham Borough Council	Town Clerk, Town Hall, West Ham, E.	do.
*Making-up Roads	Wimbledon U.D.C.	Council's Surveyor, The Broadway, Wimbledon	do.
*Additional Buildings for St. James's-road Schools	Boro' of Kingston-on-Thames	Borough Surveyor, Kingston-on-Thames	April 3
*Excavator, Bricklayer, and Mason's Work at York	North Eastern Railway	W. Bell, Architect, York	April 4
Barn, &c., Plumtree Farm, Bawtry	.....	T. Shearman, 10 and 11, Oriental Chambers, Doncaster	No date
Infirmary, Northampton	.....	C. S. Risbee, Northampton	do.
Church, Boulevard, Hull	.....	T. B. Thompson, Architect, 15, Parliament-street, Hull	do.
Church, Builth Wells, Wales	.....	Habershon & Co., Architects, Pearl-street, Cardiff	do.
Road Works, New Forest	.....	County Surveyor, The Castle, Winchester	do.
Works at Lodge, at Cemetery	Hoddesdon (Herts) Burial Board	P. R. Longmore, High-street, Hoddesdon	do.
Stables, Granville-street, Grimsby	.....	J. & C. Popple, Fish Dock-road, Grimsby	do.
Additions to Institution, Topsham-road, Exeter	.....	J. Jerman, Architect, 5, Bedford-circus, Exeter	do.
Road Metal, &c., near Wakefield	Hemsworth (Yorks) R.D.C.	T. H. Richardson, Surveyor, Hemsworth	do.
Warehouse Offices, York-place, Leeds	.....	T. H. Rhodes, Architect, 17, Hyde-terrace, Leeds	do.
Alterations to The Hall, Abergavenny	Mr. R. P. Martin	E. A. Johnson, Architect, Abergavenny	do.
Additions to Premises, West End, Bedlington	Bedlingtonshire U.D.C.	C. Brown, C.E., Bedlington	do.
Chapel, Oulton, Lowestoft	.....	F. W. Richards, Architect, Stanley-street, Lowestoft	do.
*Residence and Offices	Sheerness Permanent Bldg. Socty.	W. L. Grant, Architect, Sittingbourne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Applications to be in
*Clerk of Works (3)	Manchester Corporation	3*l.*, 3*s.* per week each	Mar. 18
*Building Inspector	City of Sheffield	120*l.*	Mar. 24
*Clerk of Works	London County Council	3*l.* 13*s.* 6*d.* per week	do.
*Clerk of Works	Slough U.D.C.	3*l.* per week	Mar. 29
*Temporary Architectural Assistant	Grimsby Corporation	120*l.*	April 2
*Clerk of Works	St. Pancras Borough Council	3*l.* 10*s.* per week	No date
*Foreman of Works	Gold Coast Government	250*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, xix. xx. & xxii.

By ERNEST OWEN.

Hampstead.—184, Belsize-rd., u.t. 52¼ yrs., g.r. nil, e.r. 11*l.* £1,000

By THOLE & NEWMAN.

Chelsea.—88, Beaufort-st., u.t. 72 yrs., g.r. 10*l.*, y.r. 75*l.* 760

Batterseа.—58 and 60, Winstanley-rd., (S.), u.t. 76 yrs., g.r. 11*l.*, w.r. 67*l.* 12s. 390

By TOWERS, ELLIS & CO.

Bayswater.—72, Westbourne Park-rd., u.t. 31¼ yrs., g.r. 7*l.*, p. 615

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 9 6	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 5 0	" " "
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts ..	1 19 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing.	5 5 0	" " "
Best Blue Pressed Staffordshire ..	4 6 6	" " "
Do., Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 5 6	" " "
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	" " "
Headers	13 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers..	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints.....	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers..	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints.....	14 0 0	" " "
Seconds Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 0d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath "	1 7	" "
Farleigh Down Bath ..	1 8	" "
Beer in blocks	1 6	" "
Grinshill "	1 10	" "
Brown Portland in blocks	2 2	" "
Darley Dale in blocks..	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 3	" "
Red Mansfield "	2 4	" "
Hard York in blocks ..	2 10	" "
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.
" " 6 in. Rubbed Ditto..	3 0	" "
" " 3 in. sawn both sides slabs (random sizes)	1 3	" "
" " 2 in. self-faced Ditto	0 9½	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
" " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
" best seconds "	11 10 0	" "
16×8 best "	6 15 0	" "
20×10 best blue Portmadoc	11 5 0	" "
16×8 best blue Portmadoc	6 0 0	" "
20×10 best Eureka unfading green....	12 2 6	" "
16×8 " "	7 5 0	" "
20×10 permanent green	10 5 0	" "
16×8 " "	5 17 6	" "

PRICES CURRENT (*Continued*).

TILES.

	s. d.		
Best plain red roofing tiles..	41 6	per 1,000,	at rly. depôt.
Hip and valley tiles....	3 7	per doz.	" "
Best Broseley tiles	48 6	per 1,000	" "
Hip and valley tiles....	4 0	per doz.	" "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	" "
Do. ornamental Do.	60 0	"	" "
Hip tiles	4 0	per doz.	" "
Valley tiles	3 9	"	" "
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000	" "
Hip tiles	4 1	per doz.	" "
Valley tiles.....	3 8	"	" "

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 10	11 10 0	
Battens: best 2½ by 6 and 3 by 6 .	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	" "	
2 in. by 4 in. and 2 in. by 6 in. .	8 10 0	9 10 0	
2½ by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
¾ in.	1 0 0	"	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	

JOINERS' WOOD.

	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0	
" " 3 in. by 9 in.	16 10 0	18 10 0	
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	13 0 0	14 0 0	
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0	
Do. 3 in. by 9 in.	11 0 0	13 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg :— First white deals, 3 in. by 11 in.	14 0 0	15 0 0	
" " " 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Second white deals 3 in. by 11 in.	13 0 0	14 0 0	
" " " 3 in. by 9 in.	12 0 0	13 0 0	
" " " battens.....	9 10 0	10 10 0	
Pitch-pine : deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Dantzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small " "	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8	
¾ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6	

	Per square.	
Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders " "	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 5 0
Hoop Iron, basis price.....	9 5 0	9 15 0
" " galvanised.....	12 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, black.— Ordinary sizes to 20 g.....	10 0 0	- - -
" " to 24 g.....	11 0 0	- - -
" " to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality :— Ordinary sizes to 20 g.....	16 10 0	- - -
" " 22 g. and 24 g.	17 0 0	- - -
" " 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe.....	17 5 0	- - -
ZINC—Sheet— Vieille Montagne..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet..... per lb.	0 1 0	- - -
Thin ..... "	0 1 1½	- - -
Copper nails..... "	0 1 1½	- - -
BRASS— Strong Sheet..... "	0 0 11	- - -
Thin " ..... "	0 1 1	- - -
TIN—English Ingots..... "	0 1 3	- - -
SOLDER—Plumbers' ..... "	0 0 6½	- - -
Tinmen's ..... "	0 0 8	- - -
Blowpipe ..... "	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft. delivered.
" fourths	2¾d.	" "
21 oz. thirds	3¼d.	" "
" fourths.....	3d.	" "
26 oz. thirds	4¼d.	" "
" fourths	4d.	" "
32 oz. thirds	5¼d.	" "
" fourths	5d.	" "
Fluted sheet, 15 oz.....	3d.	" "
" 21 "	4d.	" "
½ Hartley's Rolled Plate	2d.	" "
⅜ " " "	2½d.	" "
½ " " "	2¾d.	" "

OILS, &c.

		£ s. d.	
Raw Linseed Oil in pipes.....	per gallon	0 2 9	
" " " in barrels	"	0 2 10	
" " " in drums	"	0 3 0	
Boiled " in pipes	"	0 2 11	
" " " in barrels	"	0 3 0	
" " " in drums	"	0 3 2	
Turpentine, in barrels	"	0 2 6	
" in drums	"	0 2 8	
Genuine Ground English White Lead	per ton	21 0 0	
Red Lead, Dry	"	20 10 0	
Best Linseed Oil Putty	per cwt.	0 2 6	
Stockholm Tar	per barrel	1 12 0	

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 15 6
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work ...	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR: those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BRENTWOOD.—For repairs to the Spread Eagle, Brentwood. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, London, E.C., and Bromley-by-Bow, E. :—

T. Bruty* £286

LONDON.—For additions to stabling, Streatham Common, S.W. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. :—

Courtney & Fairbairn	£540	Smith & Sons, Ltd.	£489
W. Mason	495	Candler & Sons*	469

LONDON.—For internal decorations to a house, Streatham Common, S.W. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C. :—

Smith & Sons, Ltd.	£668	Maple & Co., Ltd.*	£565
Candler & Sons	647		

LONDON.—For the erection of stabling, Wanstead, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.:—

Osborn & Sons	£709	Battley, Sons, & Holness*	£635
W. Mundy	702		
C. J. Sherwood	691		

LONDON.—For repairs, &c., to the Joiners' Arms, Stratford, E. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, E.C., and Bromley-by-Bow, E. :—

E. F. & T. J. Walker	£258	S. Salt*	£207
A. W. Derby	239		

LONDON.—For repairs at the Albion, Stratford, E. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. :—

A. Webb	£345	J. T. Robey	£295
T. Osborn & Sons	327	E. F. & T. J. Walker*	287

LONDON.—For the erection of new banking premises at the corner of Pall-mall and Waterloo-place, S.W. (site of the Old Wanderers' Club), for Sir Henry Seymour King, M.P. Mr. A. E. Thompson, architect, Leadenhall Buildings, E.C.:—

Foster & Dickson	£27,777	Maple & Co.	£22,924
Holloway Bros.	27,200	J. Carmichael	22,280
Simpson & Son	24,657	Patman & Fotheringham*	21,963
W. Downs	23,243		

LONDONDERRY.—For the erection of (1) villa residence and (2) pair of semi-detached villas, Clooney Park, for Mr. J. A. Hamilton, solicitor, Derry. Mr. R. Eccles Buchanan, C.E., Castle-street, Londonderry :—

	Villa.		Semi-detached.
J. A. Fulton	£1,260	..	£2,000
Shannon & Routledge	1,050	..	1,700
Smyth Bros.	1,100	..	1,580
Robt. Colhoun, Strand*	1,050	..	1,500

SEACROFT.—For infectious diseases hospital, for the City of Leeds. Mr. Edwin T. Hall, architect, 54, Bedford-square, London :—

William Airey	£239,423	Armitage & Hodgson	£221,392
Roper & Sons	237,233	Nicholson & Son	211,992
Shillitoe & Sons	237,000	Arnold & Son*	198,500
Obank & Sons	234,602		

[Separate tenders were received for letting the work to the different trades, but the total of the lowest of all these was £223,391.]

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